# User's Guide

## T-BERD® 310

Remote Control

310-S User Interface

TTC

OPTIMIZING NETWORK PERFORMANCE

Digitized by the Internet Archive
in 2026

https://archive.org/details/manualsplus_12836

50-15946-01
Rev. D

# T-BERD 310
# REMOTE CONTROL
# USER'S MANUAL
## FOR THE
## 310-S USER INTERFACE

SEPTEMBER 1999

This manual addresses the T-BERD 310 Remote Control Commands
for use with the T-BERD 310 Communications Analyzer
Revision L-S.XX or earlier software

Copyright ©1998 TTC®
20400 Observation Drive, Germantown, Maryland 20876-4023 USA
USA 1-800-638-2049 • +1-301-353-1550 • FAX +1-301-353-0234
Canada 1-888-689-2165 • +1-905-507-4117 • FAX +1-905-507-4126
www.ttc.com

TTC, and T-BERD are registered trademarks of TTC.
SLC, ST, and SC are registered trademarks of Lucent Technologies.
Any additional trademarked and registered trademarked words, terms, or phrases are the property of their respective companies.
Specifications, terms, and conditions described in this document are subject to change without notice.

# TABLE OF CONTENTS


| Section | Description | Page |
|---|---|---|
| **SECTION 1** | | |
| **REMOTE CONTROL OPERATION** | | 1-1 |
| *1.1* | *INTRODUCTION* | *1-1* |
| *1.2* | *RS-232 REMOTE CONTROL OPERATION* | *1-2* |
| 1.2.1 | Setup for Remote Control Operation | 1-2 |
| 1.2.1.1 | Manual Setup for Remote Control Operation | 1-2 |
| 1.2.1.2 | Autobaud Setup for Terminal or Remote Control Operation | 1-3 |
| 1.2.2 | Remote Control Modes | 1-4 |
| 1.2.3 | Prompts in Terminal Mode | 1-4 |
| 1.2.4 | Terminating Terminal or Remote Control Operation | 1-5 |
| *1.3* | *IEEE-488 REMOTE CONTROL OPERATION* | *1-5* |
| 1.3.1 | Remote Control Setup Procedure | 1-5 |
| 1.3.2 | Remote Control Mode | 1-6 |
| 1.3.3 | IEEE-488 Programming Hints | 1-7 |
| 1.3.4 | Remote Control Commands | 1-7 |
| *1.4* | *T-BERD 310 REMOTE CONTROL COMMANDS* | *1-7* |
| 1.4.1 | Command Formats and Entry Sequence | 1-7 |
| 1.4.2 | Front-Panel Switch Commands | 1-8 |
| 1.4.3 | Auxiliary Function Commands | 1-9 |
| 1.4.4 | Remote Control-Only Commands | 1-12 |
| 1.4.5 | Input Sequence | 1-13 |
| 1.4.6 | Output Sequence | 1-13 |
| *1.5* | *DS1/DS0 ANALYZER OPTION REMOTE CONTROL COMMANDS* | *1-14* |
| 1.5.1 | Front-Panel Switch Commands | 1-14 |
| 1.5.2 | Auxiliary Function Commands | 1-15 |
| 1.5.3 | Remote Control-Only Commands | 1-15 |
| 1.5.4 | Error Messages | 1-15 |
| **SECTION 2** | | |
| **REMOTE CONTROL COMMANDS** | | 2-1 |
| *2.1* | *INTRODUCTION* | *2-1* |
| *2.2* | *T-BERD 310 MAINFRAME COMMANDS* | *2-1* |
| ALArms | Set Alarm Message Printout Control | 2-1 |
| ATM CELl BANdwidth | Transmitted ATM Primary Cell Profile Bandwidth Select | 2-2 |
| ATM CORrelation | Transmitted ATM Correlation Tag Control | 2-2 |
| ATM HEC ERRor INSert | Transmitted ATM Header Error Control Error Insert Control | 2-2 |
| ATM HEC ERRor RATe | Transmitted ATM Header Error Control Error Rate | 2-3 |
| ATM LEDS | Print State Of ATM LEDs | 2-3 |
| ATM OAM FLOw | Transmitted ATM OA&M Flow Control | 2-3 |
| ATM OAM INSert | Transmitted ATM OA&M Insert Control | 2-4 |
| ATM PEAk BANdwidth | Transmitted ATM Cell Test Profile Peak Bandwidth Select | 2-4 |
| ATM PEAk DURation | Transmitted ATM Cell Test Profile Peak Duration Select | 2-4 |
| ATM PROfile BASe | Set Test Profile Programming Mode | 2-5 |
| ATM PLCp ERRor INSert | DS1/DS3 ATM PLCP Error Insert Control | 2-5 |
| ATM PLCp ERRor RATe | DS1/DS3 ATM PLCP Error Rate Control | 2-5 |
| ATM PLCp ERRor TYPe | DS1/DS3 ATM PLCP Error Type Control | 2-6 |
| ATM RATe SELect | ATM Rate Selection Control | 2-6 |

# TABLE OF CONTENTS


| Section | Description | Page |
|---|---|---|
| ATM RX BANdwidth PERiod | Received ATM Cell Test Profile Bandwidth Select | 2-6 |
| ATM RX NETwork INTerface | Received ATM Network Interface Select | 2-6 |
| ATM RX PREview | Received ATM Cell Test Profile Preview Select | 2-7 |
| ATM RX PROfile | Received ATM Cell Test Profile Control | 2-7 |
| ATM RX SCRamble | Receiver 43-Bit Cell Payload Descrambler Control | 2-8 |
| ATM RX TESt MASk | Received ATM Cell Test Mask Control | 2-8 |
| ATM TX NETwork INTerface | Transmitted ATM Network Interface Select | 2-10 |
| ATM TX PROfile | Transmitted ATM Cell Test Profile Control | 2-10 |
| ATM TX SCRamble | Transmitter 43-Bit Cell Payload Scrambler Control | 2-11 |
| ATM TX TESt PROfile | Transmitted ATM Cell Test Profile Select | 2-11 |
| BEEp CRIteria | Set Beep Criteria | 2-11 |
| BLUe SIGnal CRIteria | Set Blue Signal Detection Criteria | 2-12 |
| CLEar PRInt BUFfer | Clear Print Buffer | 2-12 |
| CLS | Clear Terminal Screen | 2-12 |
| CONtrols | Generate Controls Printout | 2-12 |
| DISplay HOLd | Set Display Hold | 2-12 |
| DISplay | Set RESULTS Switches Control | 2-13 |
| DS1 BITs CLK | DS1 BITS Clock Termination | 2-13 |
| DS1 DROp CHAnnel | Set Dropped DS1/E1 Channel | 2-13 |
| DS1 DROp OUT | Set Dropped DS1 Channel Source | 2-14 |
| DS1 INSert CHAnnel | Set DS1 Insert Channel | 2-14 |
| DS1 LINecode | Set DS1 Transmitted Line Coding | 2-14 |
| DS1 LP CODe | Set DS1 Loop Code Type | 2-14 |
| DS1 SIGnaling BITs | DS1 Signaling Bits Transfer Mode | 2-15 |
| DS1 VT MAP | DS1/VT Mapping Select | 2-15 |
| DS3 SOUrce | Set DS3 Input Source | 2-16 |
| ECHo | Set Terminal Echo Mode | 2-16 |
| ERRor INSert BPV | Execute BPV Insertion | 2-16 |
| ERRor INSert FRAme | Execute Frame Error Insertion | 2-16 |
| ERRor INSert LOGic | Execute Logic Error Insertion | 2-17 |
| ERRor THReshold | Set Errored Second Threshold | 2-17 |
| FEAc ALArms | FEAC Message Alarm Control | 2-17 |
| FEAc LOOp | FEAC Message Loopback Control | 2-18 |
| FIRST POWERUP | Restore T-BERD 310 to Factory Defaults/Retained Settings | 2-19 |
| FRAme ERRor | Set Number of M-Frame Errors Inserted | 2-19 |
| FRaMe LOSs THReshold | Set Frame Synchronization Loss Threshold | 2-19 |
| HELLO | Display T-BERD 310 Software and Hardware Revision Levels | 2-20 |
| HELP | Display On-Line Help | 2-20 |
| HIStory RESet | Clear History Alarm LEDs | 2-21 |
| HOLd | Hold All Printer Output | 2-22 |
| JITter FILter | Set Jitter Bandpass Filter | 2-22 |
| JITter SCAle | Set Jitter Amplitude Scale | 2-23 |
| JITter THReshold | DS3 Jitter Threshold Select | 2-23 |
| LASt ERRor | Print Last Error Message | 2-24 |
| LCD CONtrast | Set 310-1 LCD Contrast | 2-24 |
| LEDs | Print State of Status and Alarm LEDs | 2-24 |
| LOCal | Return Control to the Front Panel | 2-25 |
| LOG/bpv BURst | Set Logic/BPV Burst Duration | 2-25 |
| LOG/bpv RT | Set Logic/BPV Error Insertion Rate | 2-25 |
| MODe | Set Transmit and Receive Operating Mode | 2-25 |
| OPTical POWer WAVelength | Optical Power Measurement Wavelength Select | 2-26 |

# TABLE OF CONTENTS


| Section | Description | Page |
|---|---|---|
| OPTical RETurn LOSs REFerence | Optical Return Loss Measurement Reference Control | 2-26 |
| OPTical RETurn LOSs TYPe | Optical Return Loss Measurement Type Select | 2-26 |
| OPTical SOUrce | Optical Stable Source Select | 2-27 |
| ORDerwire | Orderwire Channel Control | 2-27 |
| PARity ERRor RT | Set Parity Error Rate Calculation Criteria | 2-28 |
| PATH TRAce | Path Trace Message Insertion Control | 2-28 |
| PATTern LOSs THReshold | Set Pattern Loss Threshold Criteria | 2-29 |
| PATTern | Set Data Pattern | 2-29 |
| PGM LPDn | Set Programmable Loop-Down Code | 2-30 |
| PGM LPUp | Set Programmable Loop-Up Code | 2-30 |
| PRInt BAUd RATe | Print RS-232 Interface Baud Rate | 2-31 |
| PRInt BYTE | Print Specified TOH Byte | 2-31 |
| PRInt CONtrols | Generate Controls Printout | 2-31 |
| PRInt CUStom | Set Custom Results Printout | 2-31 |
| PRInt EVEnt | Set Print Event Function | 2-33 |
| PRInt FORmat | Set Test Results Printout Format | 2-33 |
| PRInt GRAph | Print Pulse Shape Graph | 2-34 |
| PRInt INTerval | Set Timed Print Event Interval | 2-34 |
| PRInt MODe | Set Printout Mode | 2-34 |
| PRInt PARity | Print RS-232 Interface Parity | 2-34 |
| PRInt RESults | Generate Test Results Printout | 2-35 |
| PRInt TERminator | Set Line Terminator | 2-35 |
| PRInt TOH BYTES | Print All Received Overhead Bytes | 2-35 |
| PRInt WIDth | Set Printout and Display Line Width | 2-35 |
| PRInt | Print Selected Test Result | 2-35 |
| PROmpt | Set Terminal Mode Prompt | 2-40 |
| PULse MASk | Set Pulse Shape Mask Specification | 2-41 |
| RAW LEDs | Raw DS3 Signal LED Status | 2-41 |
| RAW ATM LEDs | Raw ATM Signal LED Status | 2-42 |
| RAW SONet LEDs | Raw SONET Signal LED Status | 2-43 |
| RECeive INPut | Set Primary DS3 Receive Input Level | 2-44 |
| RELease | Release All Printer Output | 2-44 |
| REMote | Enter Remote Control Mode | 2-45 |
| RES1 or RES2 | Test Results Display I/II Control | 2-45 |
| RESTART | Initiate Test Restart | 2-46 |
| RESUlts | Generate Test Results Printout | 2-46 |
| SET DATe | Set Calendar Date | 2-46 |
| SET TIMe | Set Time of Day | 2-46 |
| SONet ALArm | SONET Alarm Insertion Select | 2-46 |
| SONet DCC | SONET Data Communication Channel Drop and Insert Control | 2-47 |
| SONet DROp | SONET Dropped Payload Format | 2-47 |
| SONet DS1 CHAnnel RX | SONET DS1 Channel Select | 2-48 |
| SONet DS1 CHAnnel TX | SONET Insert Signal Source, DS1 Channel | 2-48 |
| SONet ERRor INSert | SONET Error Insertion Select | 2-49 |
| SONet ERRor RATe | SONET Error Insertion Rate Select, BIP and FEBE Errors | 2-50 |
| SONet FRAme ERRor | SONET Error Insertion Rate Select, Frame Word Errors | 2-50 |
| SONet INPut | SONET Input Signal Source | 2-50 |
| SONet INSert | SONET Insert Signal Source | 2-51 |
| SONet LEDs | Print State of SONET Status and Alarm LEDs | 2-52 |
| SONet OUTput | SONET Output Signal Source | 2-52 |
| SONet STS ID RX | SONET Input Signal Source, STS ID | 2-53 |

# TABLE OF CONTENTS


| Section | Description | Page |
|---|---|---|
| | SONet STS ID TX — SONET Output Signal Source, STS ID | 2-54 |
| | SONet TIMing — SONET Transmit Timing Source | 2-54 |
| | SPE POInter — Synchronous Payload Envelope Pointer Control | 2-54 |
| | STS RX LEVel — STS Receive Level | 2-55 |
| | STS TX LEVel — STS Transmit Level | 2-55 |
| | SONet TX TOH — Print All Transmitted SONET Overhead Bytes | 2-55 |
| | SONet USER1 BYTe — Set Transmitted SONET USER1 Byte | 2-55 |
| | SONet USER2 BYTe — Set Transmitted SONET USER2 Byte | 2-55 |
| | TERminal — Enter Terminal Mode | 2-56 |
| | TESt LENgth — Set Timed Test Length | 2-56 |
| | TESt — Set Test Duration | 2-56 |
| | TOH BYTe — Set Transmitted SONET Overhead Byte | 2-56 |
| | TRAnsmit OUTput — Set DS3 Transmit Output Level | 2-57 |
| | TRAnsmit TIMing — Set DS3 Transmit Timing Source | 2-57 |
| | TX X-Bit — Set Transmitted X-Bit Pattern | 2-57 |
| | USER1 — Set User-Programmable Test Pattern | 2-57 |
| | WDM RX MODe — Set Dense Wavelength Division Multiplexing Receive | 2-58 |
| | WDM RX UNIts — Set Dense Wavelength Division Multiplexing Units | 2-58 |
| | WDM RX CHAnnel — Set Dense Wavelength Division Multiplexing Channel Select | 2-58 |
| | WDM RX PEAk THReshold — Set Wavelength Division Multiplexing Peak Threshold | 2-58 |
| | WDM RX PEAk EXCursion — Set Wavelength Division Multiplexing Peak Excursion | 2-59 |
| *2.3* | ***310-1 DS1/DS0 ANALYZER OPTION COMMANDS*** | ***2-59*** |
| | @CHAnnel FMT — Channel Format Select | 2-59 |
| | @CODe — Set DS1 Line Code Type | 2-59 |
| | @CONTIguous — FT1 Contiguous Channel Select | 2-60 |
| | @CONTRols — Generate Controls Printout | 2-60 |
| | @DATaport — Set DATAPORT Output | 2-60 |
| | @DISplay HOLd — Set Display Hold | 2-60 |
| | @DS0 DROp CHAnnel — Set Dropped DS0 Channel | 2-61 |
| | @DS1 SOUrce — Set DS1 Input Source | 2-61 |
| | @ERRor INSert BPV — Execute BPV Insertion | 2-61 |
| | @ERRor INSert LOGic — Execute Logic Error Insertion | 2-61 |
| | @ESF LOOp — Set ESF Loop Code Type | 2-62 |
| | @FRActional-t1 TYPe — FT1 Channel Format Select | 2-62 |
| | @HELP — Display On-Line Help | 2-62 |
| | @HIStory RESet — Clear History Alarm LEDs | 2-63 |
| | @LEDs — Print State of Status and Alarm LEDs | 2-63 |
| | @LOOp CODe — Set DS1 Loop Code Type | 2-63 |
| | @LOOp DOWn — Generate Loop-Down Code | 2-64 |
| | @LOOp UP — Generate Loop-Up Code | 2-64 |
| | @MODe — Set Transmit and Receive Operating Mode | 2-64 |
| | @NON CONtiguous — FT1 Non-Contiguous Channel Select | 2-65 |
| | @PATtern — Set Data Pattern | 2-65 |
| | @PGM LPDn — Set Programmable Loop-Down Code | 2-66 |
| | @PGM LPUp — Set Programmable Loop-Up Code | 2-66 |
| | @PRInt CONtrols — Generate Controls Printout | 2-67 |
| | @PRInt CUStom — Set Custom Results Printout | 2-67 |
| | @PRInt RESults — Generate Test Results Printout | 2-68 |
| | @PRInt — Print Selected Test Result | 2-69 |
| | @PRM EMUlate — Set PRM Transmission Control | 2-71 |

# TABLE OF CONTENTS


| Section | Description | Page |
|---|---|---|
| @PRM RECeive | PRM Results Analysis Control | 2-71 |
| @RAW LEDs | Raw DS1/DS0 Signal LED Status | 2-71 |
| @RECeive INPut | Set DS1 Receive Input Level | 2-72 |
| @RES1 or @RES2 | Test Results Display I/II Control | 2-72 |
| @RESTART | Initiate Test Restart | 2-72 |
| @RESUlts | Generate Test Results Printout | 2-73 |
| @SCAn TRIgger | Set Triggered DS1 Scan Mode Criteria | 2-73 |
| @SLIp REFerence | DS1 Timing Slip Reference Source | 2-74 |
| @TRAnsmit TIMing | Set DS1 Transmit Timing Source | 2-74 |
| @USER1 | Set User-Programmable Test Pattern | 2-74 |

**APPENDIX A**
**REMOTE CONTROL MESSAGES** **A-1**

*A.1 INTRODUCTION* ..... *A-1*
*A.2 ERROR MESSAGES* ..... *A-1*
*A.3 WARNING MESSAGES* ..... *A-3*
*A.4 GENERAL MESSAGES* ..... *A-3*

**INDEX** ..... **Index-1**

# LIST OF TABLES


| Table | Description | Page |
|---|---|---|
| 1-1 | T-BERD 310 Remote Control Capabilities | 1-1 |
| 1-2 | PRINT Auxiliary Group Parameters | 1-2 |
| 1-3 | Front-Panel Switch Commands | 1-8 |
| 1-4 | Auxiliary Function Commands | 1-9 |
| 1-5 | Remote Control-Only Commands | 1-12 |
| 1-6 | Front-Panel Switch Commands | 1-14 |
| 1-7 | Auxiliary Function Commands | 1-15 |
| 1-8 | Remote Control-Only Commands | 1-15 |
| 2-1 | DS3 Status and Alarm RAW LEDs Command | 2-42 |
| 2-2 | ATM Status and Alarm RAW LEDs Command | 2-43 |
| 2-3 | SONET Status and Alarm RAW LEDs Command | 2-43 |
| 2-4 | DS1/DS0 Status and Alarm RAW LEDs Command | 2-72 |

# SECTION 1
# REMOTE CONTROL OPERATION

## 1.1 INTRODUCTION

The purpose of the *T-BERD 310 Remote Control User's Manual* is to enable the user to quickly and easily identify remote control commands that are part of the T-BERD 310 Communications Analyzer capabilities. Instructions and applications within this document relate specifically to the *T-BERD 310 User's Manual*, for Revision L-S.XX or earlier software.

During normal operation, the T-BERD 310 can be setup and controlled through either an RS-232-compatible or an IEEE-488-compatible remote control device. The following information describes the remote control capabilities and setup procedures to configure the T-BERD 310 for remote control operation. Table 1-1 lists the interface capabilities available from the T-BERD 310.

**Table 1-1. T-BERD 310 Remote Control Capabilities**

| Function | Capabilities |
|---|---|
| Remote Interfaces | RS-232-C — female 25-pin D connector.<br>IEEE-488 — parallel connector |
| Data Rate | RS-232-C — 110, 300, 600, 1200, 2400, 4800, or 9600 b/s.<br>IEEE-488 — 300 words per second. |
| Character Length | RS-232-C — 7 bits with parity or 8 bits without parity.<br>IEEE-488 — 8 bits. |
| Line Terminator | RS-232-C — CR, LF, or CRLF.<br>IEEE-488 — CR, LF, or CRLF with EOI. |
| Flow Control | RS-232-C — DTR/CTS or in-band XON/XOFF supported. |
| Parity | RS-232-C — ODD, EVEN, or NONE. |
| Interface Configuration | RS-232-C — DCE.<br>IEEE-488 — addressable. |
| Start Bits | RS-232-C — 1 bit. |
| Stop Bits | RS-232-C — 1 bit on transmit, 1 or more on receive. |
| Column Width | 40 or 80. |
| Timing | RS-232-C — Asynchronous. |
| Character Format | ASCII character set. |

Table 1-2 lists the PRINT auxiliary group parameters used to configure the RS-232-C and IEEE-488 interfaces for remote control operation. The presentation of the T-BERD 310 test result, front panel controls, and alarm and status message printouts sent to the remote control device are described in the *T-BERD 310 User's Manual*.

**Table 1-2. PRINT Auxiliary Group Parameters**

| Auxiliary Function | Definition | Selections |
|---|---|---|
| BAUD RATE | RS-232 Interface Baud Rate | 110, 300, 600, 1200, 2400, 4800, or 9600. |
| PARITY[1] | RS-232 Interface Parity | EVEN, ODD, or NONE. |
| TERMINATOR[2] | Printout Line Terminator | CR, LF, or CRLF. |
| WIDTH | Printout Line Width | 40 or 80. |
| PORT | Printer/Remote Control Interface Port Selection | RS-232, IEEE-488/bus 0 to 30, or 488 T/O. |

1. Word length is controlled by the parity selection, 7 bits for odd or even parity and 8 bits for no parity.
2. When entering remote control operation, the line terminator defaults to CRLF.

## 1.2 RS-232 REMOTE CONTROL OPERATION

The RS-232-C interface enables the user to remotely control the T-BERD 310 from either a dumb terminal or a computer. The RS-232 interface is a 25-pin female D connector located on the side panel. It is configured to function as data communication equipment (DCE) and it can be connected directly to data terminal equipment (DTE). Connecting to another DCE is possible with the use of an adaptor cable. Auxiliary functions select the baud rate, parity error detection format, and line terminator. Refer to the *T-BERD 310 User's Manual* for a description of the RS-232 connector pin assignments.

### 1.2.1 Setup for Remote Control Operation

Before entering remote control through the RS-232 interface, the baud rate, line termination character, and parity must be set to ensure the T-BERD 310 is properly configured to communicate with the remote control device. The baud rate and parity can only be configured manually from auxiliary functions or the autobaud function. The following information describes how to setup the T-BERD 310 for manual or autobaud operation.

#### *1.2.1.1 Manual Setup for Remote Control Operation*

Use the following procedure to manually set the baud rate and parity from the front panel to match the settings of the intended remote control device.

1. **Press AUX switch**
   Select the auxiliary functions.

2. **Press MODE switch**
   Select the PRINT auxiliary group.

3. **Press PATTERN switch to select PRINT-BAUD RATE auxiliary function**
   Press the **RESULTS I Results** switch to select one of the following baud rates: 110, 300, 600, 1200, 2400 (default), 4800, or 9600.

4. **Press PATTERN switch to select PRINT-PARITY auxiliary function**
   Press the **RESULTS I Results** switch to select one of the following parity types: ODD, EVEN, or NONE. When setting PARITY to ODD or EVEN, the number of data bits equals seven; when PARITY is set to NONE, the number of data bits equals eight.

5. **Press PATTERN switch to select PRINT-TERMINATOR auxiliary function**
   Press the **RESULTS I Results** switch to select one of the following line termination characters: CR, LF, or CRLF.

6. **Press AUX switch**
   Leave the auxiliary functions.

7. **Terminal or remote operation**
   For terminal mode operation, at the remote device, press the < . > (period) key and <RETURN>, or enter the **TERminal** command and <RETURN>. The following messages appear when the T-BERD 310 and remote control device enter terminal mode. The prompt (>) indicates the T-BERD 310 is ready to receive commands.

```
Terminal mode activated.
Enter "HELP" or "?" followed by <RETURN> for help.
>
```

   For remote mode operation, at the remote device, press the < , > (comma) key and <RETURN>, or enter the **REMote** command and <RETURN>. The following message appears when the T-BERD 310 and remote control device enter the remote mode. Commands are entered in the dark; character echo is disabled.

```
Remote control activated, now in control.
```

### *1.2.1.2 Autobaud Setup for Terminal or Remote Control Operation*

The autobaud function allows baud rate, number of data bits, and parity values to be automatically configured. The autobaud function offers possible baud rates of 300, 600, 1200, 2400, 4800, and 9600 and possible parity settings of even, odd, or none. The number of data bits is determined by the parity setting. To establish communication between the remote control unit and the T-BERD 310 through the autobaud function, perform the following procedure from the remote device.

**NOTE**

The remote device must be capable of sending a BREAK signal to the T-BERD 310 to use the autobaud feature. The autobaud function must be completed within 30 seconds. If autobaud is not acquired within the 30-second period, the autobaud function is aborted and the message *Autobaud aborted.* is printed to the remote device using the current the communication settings.

1. **Press <BREAK> key once**
   The following message should appear.

```
Autobaud sequence initiated...
Press <BREAK> again, then hold down the <SPACEBAR> to enter autobaud
mode; or press <SPACEBAR> to abort.
```

2. **Press <BREAK> key again, then press <SPACEBAR> once a second until this message appears**

```
Autobaud achieved. Press <ESCAPE> to continue.
```

**3. Press <ESCAPE> key once**

The following messages appear when the T-BERD 310 and remote control device are ready to enter remote or terminal mode.

```
Character format determined.
New baud rate now in effect.
```

**4. Terminal or remote operation**

For terminal mode operation, at the remote device, press the < . > (period) key or enter the **TERminal** command and <RETURN>. The following messages appear when the T-BERD 310 and remote control device enter terminal mode. The prompt (>) indicates the T-BERD 310 is ready to receive commands.

```
Terminal mode activated.
Enter "HELP" or "?" followed by <RETURN> for help.
>
```

For remote mode, at the remote device, press the < , > (comma) key or enter the **REMote** command and <RETURN>. The following message appears when the T-BERD 310 and remote control device enter remote mode. Commands are entered in the dark; character echo is disabled.

```
Remote control activated, now in control.
```

### 1.2.2 Remote Control Modes

When operating in remote control through the RS-232 interface, the T-BERD 310 functions in either an interactive terminal mode or non-interactive remote mode.

The interactive terminal mode is used with either a dumb terminal or an interactive communications package on a personal computer emulating a dumb terminal that is connected directly to the T-BERD 310. The terminal mode (1) provides a prompt string whenever the T-BERD 310 is ready to receive a command, (2) echoes all characters back to the remote device as they are keyed in, and (3) enables access to the test results from the front panel. After entering the terminal mode, the **LOCal** command returns control of the T-BERD 310 to the front panel. The message *232 REMOTE CONTROL* flashes in the MODE/PATTERN window while the T-BERD 310 is in terminal mode.

The non-interactive remote mode allows direct interaction between the remote computer and the T-BERD 310 without interruption from the T-BERD 310. The remote mode does *not* (1) provide a prompt character, (2) echo characters back, and (3) provide front panel access. Commands are entered in the dark and automatic printouts and error messages are sent to the remote computer only upon request. The message *232 REMOTE CONTROL* flashes in the MODE/PATTERN window while the T-BERD 310 is in remote mode. After entering the remote mode, the **LOCal** command returns control of the T-BERD 310 to the front panel.

### 1.2.3 Prompts in Terminal Mode

Three possible prompts can be generated by the T-BERD 310 in the terminal mode: default greater than sign (>), user-defined, and printer-hold plus sign (+) prompts. The default ">" prompt appears when the T-BERD 310 is first placed in terminal mode. A user-defined prompt (up to 32 characters) can be created to replace the default prompt.

The user-defined prompt is created by sending the **PROmpt STRing <prompt string>** command (where **<prompt string>** are ASCII characters). This can also be used to create a prompt that identifies the T-BERD 310 attached to the terminal. A user-defined prompt is saved when the T-BERD 310 power is turned OFF.

The printer-hold "+" prompt replaces the previous prompt in response to the **HOLd** command. The "+" prompt indicates that the print buffer is not sending printouts to the terminal. Sending the **RELease** command releases the printer hold, which allows printouts to be generated again and returns the prompt to its pre-hold state.

### 1.2.4 Terminating Terminal or Remote Control Operation

To end any remote operation and return the T-BERD 310 to local control, send either **LOCal** or "*!*" followed by a <RETURN>. The T-BERD 310 front panel controls are returned to local control and the *232 REMOTE CONTROL* message is no longer displayed.

**NOTE**

Turning the power OFF also aborts a remote operating mode.

## 1.3 IEEE-488 REMOTE CONTROL OPERATION

The 310-6 IEEE-488 Option interface allows the T-BERD 310 to be connected to an IEEE-488 bus. The IEEE-488 interface and operating mode (addressable or talk-only) is selected through the PRINT-PORT auxiliary function.

In the addressable mode, the T-BERD 310 IEEE-488 bus address (a value between 0 and 30) must be set in the PRINT-PORT auxiliary function. The T-BERD 310 address allows the controller to designate the T-BERD 310 as a "listen" (receive remote commands) or "talk" (send data) device. The IEEE-488 interface connection is located on the T-BERD 310 side panel above the RS-232-C interface connector. Refer to the *T-BERD 310 User's Manual* for information on the IEEE-488 connector pin assignments.

### 1.3.1 Remote Control Setup Procedure

The following setup procedure applies to configuring the IEEE-488 interface for remote control operation.

1. **Press AUX switch**
   Select the auxiliary functions.

2. **Press MODE switch**
   Select the PRINT auxiliary group.

3. **Press PATTERN switch**
   Select the PRINT-PORT auxiliary function.

4. **Press RESULTS I Results switch**
   Select one of the following port configurations:

   **488 T/O** — Refer to the *T-BERD 310 User's Manual* for the IEEE-488 talk-only printer operation.
   **IEEE-488** — Continue with the IEEE-488 addressable setup procedure.

5. **Press RESULTS II Results switch**
   Select the bus address from 0 to 30. The address should be unique to this instrument.

6. **Press PATTERN switch to select PRINT-TERMINATOR auxiliary function**
   Select one of the following line termination characters: CR, LF, or CRLF.

7. **Press AUX switch**
   Leave the auxiliary functions.

### 1.3.2 Remote Control Mode

Prior knowledge of IEEE-488 controller programming and operation is recommended before attempting to operate the T-BERD 310 through the IEEE-488 connector. The following sections describe how to set up and operate the T-BERD 310 from an IEEE-488 controller.

In the IEEE-488 addressable remote control mode, the T-BERD 310 bus address must be set to a value between 0 and 30. This address is used by the controller to determine which device is being addressed.

Unlike an RS-232 connection, the IEEE-488 bus requires that one device on the bus act as a controller. All other devices connected to the bus must act as slaves to that controller. The T-BERD 310 can only act as a slave; another intelligent device must act as the bus controller.

**NOTE**

When in remote control mode, the **DISPLAY HOLD** switch enables the user to return to Local mode. The action of returning to Local mode causes the key to blink.

The following steps are typically performed during a remote control input sequence.

- The controller device addresses the T-BERD 310.
- The controller sends a valid remote control command.
- The controller sends a valid remote control line terminator.
- When the line terminator is received, the T-BERD 310 analyzes the remote command and performs the appropriate action.

When the characters are received, the ASCII null characters are discarded and the remaining characters are saved until the line terminator is received. Upon receipt of the line terminator, the received command is analyzed. If no error is detected, the T-BERD 310 performs the appropriate action and then prepares to receive another command. However, if an error is detected in the command string, an SRQ is asserted and the Least Significant Bit (LSB) of the serial poll register is set. If a response is appropriate, the Most Significant Bit (MSB) is set and an SRQ is asserted.

The line terminator transmitted from the T-BERD 310 can be set to carriage return (CR), linefeed (LF), or both (CRLF). Regardless of the mode or line terminator selection, the EOI signal is asserted with the final character of an entire output.

### 1.3.3 IEEE-488 Programming Hints

Before attempting to read data from a device, it is necessary to know if the device has data to send. The controller has two ways of determining that the T-BERD 310 has data: (1) Bit 7 of the serial poll register (DAV) is set whenever a line of data is available and (2) the T-BERD 310 sends an SRQ to the IEEE-488 controller whenever it has data available. An SRQ can also occur when any remote control error is detected.

The statement used to read data from the T-BERD 310 must be able to terminate the read operation when it encounters the last character of the line. The most foolproof way to detect the last character is by sensing the EOI signal.

### 1.3.4 Remote Control Commands

The following remote control commands *cannot* be used when controlling the T-BERD 310 from an IEEE-488 controller. An error message may occur when attempting to use any of these commands.

| | |
|---|---|
| ECHo | Echo in Terminal Mode |
| LOCal | Return Control to the Front Panel |
| PROmpt | Prompts in Terminal Mode |

## 1.4 T-BERD 310 REMOTE CONTROL COMMANDS

This section presents the formats and entry sequence for remote control commands, as well as an alphabetical list of all the remote control commands. The T-BERD 310 remote control commands are described in Section 2 in alphabetical order.

Three primary command types are available with the T-BERD 310 remote control facility:

- Switch commands set the T-BERD 310 front-panel switches.
- Auxiliary commands set the T-BERD 310 auxiliary functions.
- Control commands pertain exclusively to remote control operation.

### 1.4.1 Command Formats and Entry Sequence

The general format for any remote control command is:

**command_name or**
**command_name [parameter]**

The **command_name** entry specifies the name of the executed command. The **command_name** may be abbreviated to the first three characters (e.g., **TERminal**), however some **command_names** require additional characters (e.g., **RESTART**). Multiple word **command_names** require a space between each word.

The **[parameter]** entry specifies any parameter(s) associated with the command. A **[parameter]** must be separated from the **command_name** by at least one space. The **[parameter]** may be abbreviated to the first three characters (e.g., **TRAnsmit TIMing [EXTernal]**), however some **[parameters]** require additional characters (e.g., **DS1 LP CODe [FAC1]** or **PATTern [USER1]**). Multiple word **[parameters]** require a space between each word. The on-line **HELP <command>** page displays the required characters in UPPERCASE and the optional characters in lowercase.

**NOTE**

The DS1/DS0 Analyzer Option commands require an "@" character to precede each command to distinguish the command from the T-BERD 310 mainframe commands. Refer to Section 1.5 for additional information.

Most remote control commands can be used to select a new command state or to display the status of the command. To select a new command state, enter both the **command_name [parameter]** string on the command line. To display the current state of a command, enter the **command_name** only or follow it with a space and a question mark (**?**). Note, however, that some commands (e.g., **CLS**) are "executable only" and have no current or changeable state. The **command_name [parameter]** string should always be followed by a <RETURN>.

Error messages are generated by improper command and parameter syntax, parameters out-of-range, or improper configurations. Error messages are formatted with the prefix "*****ERROR**" or "*****WARNING**", the message indicating the problem, and in some cases the improperly entered command or parameter. Error messages are available in all modes. The error and warning messages are described in Appendix A.

Remote control commands are divided into three basic groups: switch commands, auxiliary function commands, and remote control-only commands. The command groups are described in the following sections.

### 1.4.2 Front-Panel Switch Commands

The T-BERD 310 switch commands control the functions normally associated with the front panel switches. Mnemonics represent the first three characters of the switch name or switch position as it appears on the front panel. Table 1-3 lists the switch commands that apply to the mainframe switches. The brackets ([ ]) indicate the availability of associated parameters. The parameters associated with each command are described in Section 2.2.

**Table 1-3. Front-Panel Switch Commands**

| Command | Switch Name | Description |
|---|---|---|
| ATM HEC ERRor INSert [ ] | ERROR INSERT-ATM HEC | Insert ATM HEC errors |
| DISplay HOLd [ ] | DISPLAY HOLD | Locks out front panel result or LED updates. (When in remote control mode, it enables user to return to local mode. When pressed, the key blinks.) |
| DS1 DROp CHAnnel [ ] | Channel Control DS3-DS1 (Drop) | Select DS1 Channel to be dropped from a DS3 signal. |
| DS1 INSert CHAnnel [ ] | Channel Control DS3-DS1 (Insert) | Select DS1 Channel to be inserted into a DS3 signal. |
| DS3 SOUrce [ ] | DS3 SOURCE | Specify EXT or SONET as the source of the DS3 signal to analyze. |
| ERRor INSert BPV | ERROR INSERT-BPV | Insert DS3 BPV errors. |
| ERRor INSert FRAme | ERROR INSERT-FRAME | Insert DS3 Frame errors. |
| ERRor INSert LOGic | ERROR INSERT-LOGIC | Insert DS3 Logic bit errors. |
| HIStory RESet | HISTORY RESET | Reset History SONET, ATM and DS3 LEDs. |
| MODe [ ] | Setup - DS3 (Mode) | Specify DS3 Framing Mode. |
| PATTern [ ] | Setup - DS3 (Pattern) | Specify DS3 Pattern type. |
| RES1 [ ] | RESULTS I | Set front panel results display to a category. |
| RES2 [ ] | RESULTS II | Set front panel results display to a category. |
| RESTART | RESTART | Restart a mainframe test. |
| RESULTS | PRINT RESULTS | Generate Test Results Printout |

**Table 1-3. Front-Panel Switch Commands (Continued)**

| Command | Switch Name | Description |
|---|---|---|
| SONet ALArm [ ] | ALARM INSERT | Insert a SONET Alarm. |
| SONet DROp [ ] | Setup - SONET RX (Payload) | Specify a SONET Payload type to receive. |
| SONet DS1 CHAnnel RX[ ] | Channel Control - STS-VT (Drop) | Specify a VT1.5 channel to analyze in the selected STS-1. |
| SONet DS1 CHAnnel TX[ ] | Channel Control - STS-VT (Insert) | Specify a VT1.5 channel to insert in the selected STS-1. |
| SONet ERRor INSert | ERROR INSERT-SONET | Insert a SONET error. |
| SONet INPut | SETUP - SONET RX (Rate) | Specify a SONET rate to receive. |
| SONet INSert | SETUP - SONET TX (Payload) | Specify a SONET payload type to transmit. |
| SONet OUTput | SETUP - SONET TX (Rate) | Specify a SONET rate to transmit. |
| SONet STS ID RX | Channel Control SONET-STS (Drop) | Specify a SONET STS-1 channel to receive. |
| SONet STS ID TX | Channel Control SONET-STS (Insert) | Specify a SONET STS-1 channel to insert. |
| SONet TIMing [ ] | SONET TRANSMIT TIMING | Specify a timing source to transmit a SONET signal. |
| TRAnsmit TIMing [ ] | DS3 TRANSMIT TIMING | Specify a timing source to transmit a DS3 signal. |

### 1.4.3 Auxiliary Function Commands

The T-BERD 310 auxiliary function commands set the parameters of the auxiliary functions. Table 1-4 lists the auxiliary function commands that apply to the mainframe auxiliary functions. The brackets ( [ ] ) indicate the availability of associated parameters. The parameters associated with each command are described in Section 2.2.

**Table 1-4. Auxiliary Function Commands**

| Command | Auxiliary Function Name | Description |
|---|---|---|
| ATM CELl BANdwidth [ ] | ATM TX-CELL BANDWDTH | Select the transmitted ATM cell test profile bandwidth. |
| ATM CORrelation [ ] | ATM TX-CORRELATION | Transmitted ATM Correlation Tag control. |
| ATM HEC ERRor INSert [ ] | ATM TX-HEC ERR INS | Transmitted ATM Header Error Control Error Insert control. |
| ATM HEC ERRor RATe [ ] | ATM TX-HEC ERR RATE | Transmitted ATM Header Error Control Error Rate. |
| ATM OAM FLOw [ ] | ATM TX-OAM FLOW | Transmitted ATM OAM Flow control. |
| ATM OAM INSert [ ] | ATM TX-OAM INSERT | Transmitted ATM OAM Insert control. |
| ATM PEAk BANdwidth [ ] | ATM TX-PEAK BANDWDTH | Select the transmitted ATM cell test profile peak bandwidth. |
| ATM PEAk DURation [ ] | ATM TX-PEAK DURATION | Transmitted ATM cell test profile peak duration. |
| ATM RX BANdwidth PERiod [ ] | ATM RX-BW PERIOD | Select the received ATM cell test profile bandwidth. |
| ATM RX NETwork INTerface [ ] | ATM RX-NETWORK I/F, Select | Select the received ATM network interface. |
| ATM RX PREview | ATM RX-PREVIEW | Received ATM cell test profile preview selection. |
| ATM RX PROfile [ ] | ATM RX-PROFILE P1 | Transmitted ATM cell test profile control. |
| ATM RX SCRamble [ ] | ATM RX-NETWORK I/F, Scramble | Receiver 43-Bit Cell Payload Descrambler Control. |
| ATM RX TESt MASk [ ] | ATM RX-TEST MASK | Received ATM Cell Test Mask Control. |
| ATM TX NETwork INTerface [ ] | ATM TX-NETWORK I/F, Select | Transmitted ATM network interface selection. |

**Table 1-4. Auxiliary Function Commands (Continued)**

| Command | Auxiliary Function Name | Description |
|---|---|---|
| ATM TX PROfile [ ] | ATM TX-PROFILE P1 | Transmitted ATM cell test profile control. |
| ATM TX SCRamble [ ] | ATM TX-NETWORK I/F, Scramble | Transmitter 43-Bit Cell Payload Scrambler control. |
| ATM TX TESt PROfile [ ] | ATM TX-TEST PROFILE | Transmitted ATM cell test profile selection. |
| BEEp CRIteria [ ] | MISC-BEEP CRI | Configure the automatic beep on selected events. |
| BLUe SIGnal CRIteria [ ] | MISC-BLU SIG CRI | Select the blue signal criteria for 1010 or Stuck C-Bit algorithms. |
| CONtrols [ ] | CONTROLS | Generate a Mainframe Controls printout. |
| DS1 BITs CLK [ ] | MISC-DS1 BITS CLK | Select an input termination setting for the BITS clock input jack; term or bridge. |
| DS1 DROp OUT [ ] | SONET RX-DS1 DROP OUT | Set up the side panel DS1 DROP OUT connection by using a DS1 from SONET or DS3. |
| DS1 LINecode [ ] | MISC-DS1 LINECODE | Select a DS1 line coding for AMI or B8ZS from the mainframe. |
| DS1 LP CODe [ ] | MUXED TX-DS1 LP CODE | Sets the DS1 loopback in Muxed DS3 mode to CSU, FAC1, FAC2 or User. |
| DS1 SIGnaling BITs [ ] | MISC-DS1 SIG BITS | Configure the SONET receiver for pass through or outslot treatment of signaling bits in byte sync mode. |
| DS1/VT MAP [ ] | MISC-DS1/VT MAP | Configure the SONET DS1 mappings either sequentially, according to Bellcore, or similar to M13 mux equipment. |
| ERRor THReshold [ ] | ERR RECEIVE-ERROR THR | Sets the error rate threshold for DS3 Severely Errored Seconds. |
| FEAc ALArms [ ] | MISC-FEAC ALARMS | Generate Far End Alarms in DS3 C-Bit mode. |
| FEAc LOOp [ ] | MISC-FEAC LOOP | Generate Far End Loop Codes in DS3 C-Bit mode. |
| FRAme ERRor [ ] | ERR INSERT-FRAME ERROR | Sets the DS3 Frame Error Insert function to 1/M-Frame or 2/M-Frame. |
| FRaMe LOSs THReshold [ ] | ERR RECEIVE-FRM LOSS THR | Sets the DS3 Frame Loss Threshold at 3 of 15 frames or 6 of 15 frames. |
| JITter FILter [ ] | JITTER-JIT FILTER | Select a filter to analyze DS3 Jitter, Highband, Wideband or automatically cycle between both filters. |
| JITter SCAle [ ] | JITTER-JIT SCALE | Select a scale to analyze DS3 Jitter; 20, 5, 2 unit intervals, or automatically select the best scale. |
| JITter THReshold [ ] | JITTER-JIT THRESH | Select a threshold of incoming jitter after which the jitter result appears in the Summary category. |
| LCD CONtrast | MISC-LCD CONTRAST | Adjust the contrast of the 310-1 Option (not available on older units). |
| LOG/bpv BURst [ ] | ERR INSERT-LOG/BPV BUR | Set Logic/BPV Burst Duration. |
| LOG/bpv RaTe [ ] | ERR INSERT-LOG/BPV RT | Sets the DS3 Logic and BPV Error Insert Rate. |
| OPTical POWer WAVelength [ ] | OPTICAL TEST-OPTICAL PWR | Select 1310 or 1550 wavelength to calculate Optical Power. |
| OPTical RETurn LOSs REFerence [ ] | OPTICAL TEST-RTN LOSS TYPE, Store Reference | Return Loss Measurement Set reference. |
| OPTical RETurn LOSs TYPe [ ] | OPTICAL TEST-RTN LOSS TYPE, Select | Return Loss Measurement Type selection. |
| OPTical SOUrce [ ] | OPTICAL TEST-OPTICAL SRC | Select 1310 or 1550 wavelength to transmit as a stable source and to calculate Optical Return Loss. |

**Table 1-4. Auxiliary Function Commands (Continued)**

| Command | Auxiliary Function Name | Description |
|---|---|---|
| ORDerwire [ ] | SONET TX-ORDERWIRE | Select the SONET Orderwire channel to Drop or Insert from Section or Line to the side panel connector. |
| PARity ERRor RT [ ] | ERR RECEIVE-PAR ERR RT | Sets DS3 Parity Error Calculation for Bit or Block mode. |
| PATH TRAce [ ] | SONET TX-PATH TRACE | Select a Path Trace message to transmit in the SONET signal. |
| PATTern LOSs THReshold [ ] | ERR RECEIVE-PAT LOSS THR | Sets the DS3 Pattern Loss Threshold for Fast or Slow. |
| PGM LPDn [ ] | MUXED TX-PGM LPDN | Programs the User DS1 Loop Down code. |
| PGM LPUp [ ] | MUXED TX-PGM LPUP | Programs the User DS1 Loop Up code. |
| PRInt BAUd RATe | PRINT-BAUD RATE | Print RS-232 interface baud rate. |
| PRInt CUStom [ ] | PRINT-CUSTOM | Configure a custom Results printout. |
| PRInt EVEnt [ ] | PRINT-EVENT | Set up a print event operation, including timed, errored second, test end, 15 minute, 30 minute. |
| PRInt FORmat [ ] | PRINT-FORMAT | Select a Test Results printout format, normal, summary or custom. |
| PRInt GRAph | PRINT-GRAPH | Print a DS3 Pulse Shape graph |
| PRInt INTerval [ ] | PRINT-INTERVAL | Set a custom print interval in hours:minutes. |
| PRInt MODe [ ] | PRINT-MODE | Select a printer results mode; Delta or Continuous. |
| PRInt PARity | PRINT-PARITY | Print RS-232 interface parity |
| PRInt TERminator [ ] | PRINT-TERMINATOR | Set line termination character: cr, lf or crlf. |
| PRInt WIDth [ ] | PRINT-WIDTH | Set a printout and display line width of 40 or 80 characters. |
| PULse MASk [ ] | MISC-PULSE MASK | Select a specification to evaluate the DS3 Pulse Shape against; 1991 ANSI, 1993 ANSI or CCITT. |
| RECeive INPut | MISC-D53 LEVEL | Configure the DS3 Receive Input setting for DSX, HIGH or LOW. |
| RESUlts | RESULTS | Generate a Mainframe Results printout. |
| SET DATe [ ] | TIME-SET DATE | Sets the calendar date. |
| SET TIMe [ ] | TIME-SET TIME | Set the time of day. |
| SONet ALArm [ ] | SONET TX-SONET ALARM | SONET Alarm Insertion Select. |
| SONet DCC [ ] | SONET RX-SONET DCC | Select the SONET DCC to Drop or Insert from Section or Line to the side panel connector. |
| SONet DROp [ ] | SONET RX-SONET DROP | SONET Dropped Payload Format |
| SONet DS1 CHAnnel RX [ ] | SONET RX-SONET DS1 CH | SONET DS1 Channel Select |
| SONet DS1 CHAnnel TX [ ] | SONET TX-SONET INSERT, DS1 Channel | SONET Insert Signal Source, DS1 Channel |
| SONet ERRor RATe [ ] | SONET TX-SONET ERR RT | Configure a SONET Error Rate. |
| SONet FRAme ERRor [ ] | SONET TX-SONET ERR RT, Frame Error | SONET Error Rate Select, Frame Error; select the number of SONET Frame Word errors to insert. |
| SONet INPut [ ] | SONET RX-SONET INPUT | SONET Input Signal Source. |
| SONet INSert [ ] | SONET TX-SONET INSERT | SONET Insert Signal Source. |
| SONet OUTput [ ] | SONET TX-SONET OUTPUT | SONET Output Signal Source. |
| SONet STS ID RX [ ] | SONET RX-SONET INPUT, STS ID | SONET Input Signal Source, STS ID. |
| SONet STS ID TX [ ] | SONET TX-SONET OUTPUT, STS ID | SONET Output Signal Source, STS ID. |
| SONet TIMing [ ] | SONET TX-SONET TIMING | SONET Transmit Timing Source. |

**Table 1-4. Auxiliary Function Commands (Continued)**

| Command | Auxiliary Function Name | Description |
|---|---|---|
| SONet TRAnsmit WAVelength OC-12 | SONET TX - TX WAVE-LENGTH, OC-12 | Select 1310 or 1550 nm wavelength to transmit for SONET at OC-12. |
| SONet TRAnsmit WAVelength OC-3 | SONET TX - TX WAVE-LENGTH, OC-3 | Select 1310 or 1550 nm wavelength to transmit for SONET at OC-1 and OC-3. |
| SPE POInter [ ] | SONET TX-SPE POINTER | Configure the Path Pointer to increment or decrement. |
| STS RX LEVel [ ] | SONET RX-STS RX LEVEL | Select an STS-1 receive level as HIGH or DSX. |
| STS TX LEVel [ ] | SONET TX-STS TX LEVEL | Select a STS-1 Transmit level at HIGH or DSX. |
| TESt [ ] | TEST LENGTH | Configures a test for timed or continuous operation. |
| TESt LENgth [ ] | TIME-TEST LENGTH | Configures a test length for a timed test. |
| TRAnsmit OUTput | MISC-D53 LEVEL | Configure the DS3 Transmit Output setting for DSX, HIGH or LOW. |
| TX X-Bit [ ] | MISC-TX X-BIT | Configure the transmitted X-Bits as 11, 00 or emulate to automatically send yellow as needed. |
| USER1 [ ] | MISC-USER1 | Program a DS3 user test pattern to transmit. |

### 1.4.4 Remote Control-Only Commands

The T-BERD 310 remote control-only commands have no front panel or auxiliary function equivalent. These commands are used to obtain information from the T-BERD 310 or to modify the remote control/printer protocol. Table 1-5 lists the remote control-only commands. The brackets ([ ]) indicate the availability of associated parameters. The parameters associated with each command are described in Section 2.2.

**Table 1-5. Remote Control-Only Commands**

| Command | Description |
|---|---|
| ALArms [ ] | Select whether or not alarms are automatically generated by remote on the printer. |
| ATM LEDs | Generates a report of all ATM Status and Alarm LEDs. |
| CLEar PRInt BUFfer | Clears the print buffer. |
| CLS | Clears the remote controlled screen. |
| DISplay [ ] | Set RESULTS Switches control controls whether or not the local user can scroll results while the unit is under remote control. |
| ECHo [ ] | Set Terminal Echo Mode. |
| FIRST POWERUP | Restore T-BERD 310 to factory default settings. However, this command allows the unit to retain prior settings for print device, print baud rate, parity, line terminator, and IEEE-488 address. |
| HELLO | Generates a report of all installed options and the hardware and software revision codes. |
| HELP [ ] | Displays on-line Help for any remote control command. |
| HOLd | Holds all printouts in the print buffer until Release is entered. |
| LASt ERRor | Prints the last remote control error message sent to the user. |
| LEDs | Generates a report of all DS3 Status and Alarm LEDs. |
| LOCAL (/) | Return control to the front panel; gives the local user control over the test set. |
| PRInt [ ] | Print selected test result. |
| PROmpt [ ] | Set Terminal Mode prompt. |
| RELease | Release all printer output. |
| REMote (,) | Enter Remote Control Mode. |
| SONet LEDs | Generates a report of all SONET Status and Alarm LEDs. |
| TERminal (.) | Enter Terminal Mode. |

### 1.4.5 Input Sequence

A remote command consists of an ASCII character string followed by either a CR, LF, or CRLF. When specifying a remote control command, the following rules apply:

- Commands can be entered either in uppercase, lowercase, or mixed case characters.
- Spaces must be inserted between the **command_name(s)** and **[parameter(s)]**.
- Entering a <CTRL> <C> (Control C) or a <CTRL> <X> (Control X) before issuing a <RETURN> cancels the input line. (<CTRL> <C> also aborts all printing.)
- Entering a <CTRL> <H> (Control H) or a <BACKSPACE> erases the last character entered. This is available for the RS-232 interface only.
- Up to 20 previously entered commands can be recalled by using <ESCAPE>. When the number of previously sent commands exceeds 20, the earliest command entries are overwritten. This is available for the RS-232 and IEEE-488 interface.

After receiving a line terminator, the T-BERD 310 analyzes the data in its input buffer. It checks the data for parity, overrun, framing, overflow, and syntax errors as it is received. If any error is detected, the appropriate error message is returned through the interface. If no error is detected, the command is executed and the appropriate response generated.

If the **ECHo** command is enabled, the entered character string is echoed back to the controller. If the **PROmpt** command is enabled, the default prompt ( > ) or a user-defined prompt is used to indicate that the previous command has been processed and that the T-BERD 310 is ready to accept another command.

**NOTE**

The **TERminal** command automatically enables **ECHo** and **PROmpt** when entering the terminal mode. With either the **PROmpt** or **ECHo** command enabled, any characters used to cancel a line are echoed to the remote control unit. The prompt and echo features are only applicable for the RS-232 interface.

### 1.4.6 Output Sequence

The following rules apply for output sequences:

- All remote control output sequences have a higher priority than the print buffer.
- The **HOLd** command suspends the printer output until the **RELease** command is sent. When sending the **HOLd** command and the prompt is ON, the prompt character automatically changes to a "+" to indicate that data is waiting to be printed. After sending the **RELease** command and if the prompt is ON, the default prompt (>) or the user-defined prompt is returned. Note that the remote control output is not affected by **HOLd**.
- <CTRL> <S> suspends all output. Sending a <CTRL> <Q> (Control Q), releases the printer output suspended by the <CTRL> <S>. These control characters only apply for RS-232 controllers.
- Sending a <CTRL> <C> (Control C) clears the entire print buffer.

## 1.5 DS1/DS0 ANALYZER OPTION REMOTE CONTROL COMMANDS

This section describes the 310-1 DS1/DS0 Analyzer Option remote control commands used to control the DS1/DS0 Analyzer Option from a remote device.

All DS1/DS0 Analyzer Option commands must be preceded with an "@" character to distinguish them from T-BERD 310 mainframe commands. The DS1/DS0 Analyzer Option commands are divided into three categories: front-panel switch commands, auxiliary function commands, and remote control-only commands. The DS1/DS0 Analyzer Option commands are described in alphabetical order in Section 2.3.

When remote control is activated (enter valid command), both the DS1/DS0 Analyzer Option and the T-BERD 310 are placed under remote control. The same applies to exiting remote control. While in remote control, the front-panel switches on both panels are disabled except for the **RESULTS** switches.

### 1.5.1 Front-Panel Switch Commands

The DS1/DS0 Analyzer Option switch commands control the functions normally associated with the front panel switches. Mnemonics represent the first three characters of the switch name or switch position as it appears on the front panel. The front-panel switch commands are listed alphabetically in Table 1-6.

**Table 1-6. Front-Panel Switch Commands**

| Command | Switch Name | Description |
|---|---|---|
| @CODe | CODE | Set DS1 Line Code Type |
| @CONtrols | PRINT CONTROLS | Generate Controls Printout |
| @DISplay HOLd [ ] | DISPLAY HOLD | Set Display Hold |
| @DS0 DROp CHAnnel [ ] | DS0 DROP CHANNEL | Set Dropped DS0 Channel |
| @DS1 SOUrce [ ] | DS1 SOURCE | Set DS1 Input Source |
| @ERRor INSert BPV [ ] | BPV ERROR INSERT | Execute BPV Insertion |
| @ERRor INSert LOGic [ ] | LOGIC ERROR INSERT | Execute Logic Error Insertion |
| @HIStory RESet | HISTORY RESET | Clear History Alarm LEDs |
| @LOOp DOWn [ ] | LOOP DOWN | Generate Loop-Down Code |
| @LOOp UP [ ] | LOOP UP | Generate Loop-Up Code |
| @MODe [ ] | MODE | Set Transmit and Receive Operating Mode |
| @PATtern [ ] | PATTERN | Set Data Pattern |
| @PRInt RESults | PRINT RESULTS | Generate Test Results Printout |
| @RECeive INPut [ ] | RECEIVE INPUT | Set DS1 Receive Input Level |
| @RES1 [ ] or @RES2 [ ] | RESULTS I or II | Result Display I/II Control |
| @RESTART | RESTART | Initiate Test Restart |
| @RESUlts | PRINT RESULTS | Generate Test Results Printout |
| @TRAnsmit TIMing [ ] | DS3 TRANSMIT TIMING | Set DS1 Transmit Timing Source |

### 1.5.2 Auxiliary Function Commands

The DS1/DS0 Analyzer Option auxiliary function commands set the parameters of the auxiliary functions. The auxiliary function commands are listed alphabetically in Table 1-7.

**Table 1-7. Auxiliary Function Commands**

| Command | AUX Name | Description |
|---|---|---|
| @CHAnnel FMT [1] | AUX-CHAN FMT, Format | Channel Format Select |
| @CONTIguous [1] | AUX-CONTIg | FT1 Contiguous Channel Select |
| @DATaport [ ] | AUX-DATAPORT | Set DATAPORT Output |
| @ESF LOOp [ ] [1] | AUX-ESF LOOP | ESF Loop Code Select |
| @FRActional-t1 TYPe [1] | AUX-CHAN FMT, 64xN | FT1 Channel Format Select |
| @LOOp CODe [ ] | AUX-LP CODE | Set DS1 Loop Code Type |
| @NON CONtiguous [1] | AUX-N-CONTIG | FT1 Non-Contiguous Channel Select |
| @PGM LPDn [ ] | AUX-PGM LPDN | Set Programmable Loop-Down Code |
| @PGM LPUp [ ] | AUX-PGM LPUP | Set Programmable Loop-Up Code |
| @PRInt CUStom [ ] | AUX-CUSTOM | Set Custom Results Printout |
| @PRM EMUlate [ ] [1] | AUX-PRM | Set PRM Transmission Control |
| @PRM RECeive [ ] [1] | AUX-PRM | PRM Results Analysis Control |
| @SCAN TRIgger [ ] | AUX-SCAN TRIG | Set Triggered DS1 Scan Mode Criteria |
| @SLIp REFerence [ ] [1] | AUX-SLIP REF | DS1 Timing Slip Reference Source |
| @USER1 [ ] | AUX-USER1 | Set User-Programmable Test Pattern |

1. Requires the 310-9B option.

### 1.5.3 Remote Control-Only Commands

The DS1/DS0 Analyzer Option remote control-only commands have no front panel or auxiliary function equivalent. These commands are used to obtain information from the DS1/DS0 Analyzer Option or to modify the remote control/printer protocol. The remote control-only commands are listed alphabetically in Table 1-8.

**Table 1-8. Remote Control-Only Commands**

| Command | Description |
|---|---|
| @HELP | Display On-Line Help |
| @LEDs | Print State of Status and Alarm LEDs |
| @PRInt [ ] | Print Selected Test Result |

### 1.5.4 Error Messages

A command entered without the "@" character can be interpreted as a T-BERD 310 command or as invalid. If an invalid command is entered, the T-BERD 310/310-1 sends an error message indicating the error. Refer to Appendix A for additional error messages.

# SECTION 2
# REMOTE CONTROL COMMANDS

## 2.1 INTRODUCTION

This appendix describes the T-BERD 310 mainframe and DS1/DS0 Analyzer Option remote control commands in alphabetical order. Unless otherwise indicated, the remote control commands apply to the T-BERD 310 mainframe. Remote control commands that require an option to be installed are identified by the option number as follows:

- 310-1 — DS1/DS0 Analyzer Option
- 310-2 — E1 Drop Option
- 310-3 — DS1 Insert/Secondary DS3 Option
- 310-5 — DS3 Jitter Option
- 310-9B — Enhanced DS1 Testing Option
- 310-10 — G.821 Results Option
- 310-12-1300 — SONET OC-12/12c Transmit/Receive Option
- 310-12-DUAL — SONET OC-12/12c Dual Wavelength Option
- 310-13R — SONET STS-1 Receive Option
- 310-13T — SONET STS-1 Transmit Option
- 310-14R — SONET STS-1, OC-1/3/3c Receive Option
- 310-14T - 1300 — SONET STS-1, OC-1/3/3c Transmit Option
- 310-14T-DUAL — SONET OC-1/OC-3 Dual Wavelength Option
- 310-15 — OC-3c ATM Analysis Option
- 310-16 — Optical Media Test Option
- 310-17A — DS1/DS3 ATM Analysis Option
- 310-18 — Manufacturing Software Option
- 310-20 — OC-12c ATM Analysis Option
- 310-21- 1500 — SONET OC-48/48c Transmit/Receive Option
- 310-21- DUAL — SONET OC-48/48c Transmit/Receive Option
- 310-22 — DWDM Channel Monitor Option

## 2.2 T-BERD 310 MAINFRAME COMMANDS

The following remote control commands apply to the T-BERD 310 mainframe controls, indicators, connections, displays, and auxiliary functions.

### ALArms — Set Alarm Message Printout Control

**ALA ?**

Print current alarm message printout status.

**ALA ON**

Enable alarm message printout control. Alarm, status, and note messages are printed when a print event is selected. When the **PRInt EVEnt** command is **OFF**, the **ALArms ON** command is not functional.

**ALA OFF**

Disable alarm message printout control. Alarm, status, and note messages are not printed when a print event is selected.

## ATM CELl BANdwidth — Transmitted ATM Primary Cell Profile Bandwidth Select

**ATM CEL BAN ?**

Print current primary profile cell bandwidth: test, background, and idle. This command requires the 310-15 option, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM CEL BAN <test,background>**

Set primary test and background profile cell bandwidth. This command requires the 310-15 option, 310-17A, or 310-20 option. Enter **<test,background>** where test and background parameters go from 0% to 100% in 0.1% steps for OC-3c and OC-12c and 0.4% steps for DS1 and DS3. The command is only valid when the test set is configured to transmit ATM cells.

See also: **ATM RX BANdwidth PERiod, ATM PEAk BANdwidth, ATM PEAk DURation,** and **SONet INPut**

## ATM CORrelation — Transmitted ATM Correlation Tag Control

**ATM COR ?**

Print transmitted correlation tag. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM COR xxxx**

Set correlation tag from 0000 to FFFF. **x** equals 0 to F. This allows multiple T-BERD 310s to be differentiated from one another. The correlation tag is two bytes long. The entered value is transmitted from left to right.

See also: **SONet INPut**

## ATM HEC ERRor INSert — Transmitted ATM Header Error Control Error Insert Control

**ATM HEC ERR INS ?**

Print current HEC error rate type and insertion rate. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM HEC ERR INS [ NON | COR ] BUR**

Insert a non-correctable or correctable burst of HEC errors. Set burst duration with the **ATM HEC ERRor RATe BURst** command and error rate with the **ATM HEC ERRor RATe x** command.

**ATM HEC ERR INS [ NON | COR ] OFF**

Disable inserted non-correctable or correctable HEC errors.

**ATM HEC ERR INS [ NON | COR ] RAT**

Insert non-correctable or correctable HEC errors at specified error rate. Set error rate with the **ATM HEC ERRor RATe** command.

See also: **ATM HEC ERRor RATe** and **SONet INPut**

## ATM HEC ERRor RATe — Transmitted ATM Header Error Control Error Rate

**ATM HEC ERR RAT ?**

Print current HEC error rate and the number of consecutive cells affected by the inserted errors. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM HEC ERR RAT <rate,burst>**

Set HEC error rate and burst rate. Enter the **<rate,xx>** parameter from **2** to **9** or **C** (continuous). Entering the **C** inserts a bit error in every transmitted cell. Enter the **<xx,burst>** parameter from **1** to **10** (no leading zero). Insert HEC errors with the **ATM HEC ERRor INSert** command.

See also: **ATM HEC ERRor INSert** and **SONet INPut**

## ATM LEDS — Print State Of ATM LEDs

**ATM LEDS**

This command prints the state of the ATM LEDs, and information on the state of other ATM events reported in the display of the unit. Below is an example of the type of printout:

```
> atm leds
```

```
                - alarms -          |          - status -
                                    |
    OFF  OFF  ocd                   |        OFF cell sync
    OFF  OFF  ais                   |_____________________
    OFF  OFF  rdi                   |
    OFF  OFF  lcd
    OFF  OFF  lcd fail
    OFF  OFF  plcp rdi
    OFF  OFF  all idle cells
    OFF  OFF  no masked cells

     |_____ history _____|
```

## ATM OAM FLOw — Transmitted ATM OA&M Flow Control

**ATM OAM FLO ?**

Print current OA&M format and signal function for the alarm or loopback selected from the **ATM OAM INSert** command (select signal first). This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM OAM FLO [ VPC | VCC ] END**

Send OA&M signal for a virtual path connection (VPC) or a virtual channel connection (VCC) in an end-to-end test.

**ATM OAM FLO [ VPC | VCC ] SEG**
Send OA&M signal for a virtual path connection (VPC) or a virtual channel connection (VCC) in a segmented test.

See also: **ATM OAM INSert** and **SONet INPut**

## ATM OAM INSert — Transmitted ATM OA&M Insert Control

**ATM OAM INS ?**
Print current OA&M fault management signal. Refer to the **ATM OAM FLOw** command to set signal format and function. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM OAM INS AIS**
Send OA&M AIS signal.

**ATM OAM INS LOO**
Send OA&M loopback cells.

**ATM OAM INS OFF**
Disable OA&M signal.

**ATM OAM INS RDI**
Send OA&M RDI signal.

See also: **ATM OAM FLOw** and **SONet INPut**

## ATM PEAk BANdwidth — Transmitted ATM Cell Test Profile Peak Bandwidth Select

**ATM PEA BAN**
Print current percentage of burstiness for the primary test profile peak bandwidth. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM PEA BAN xx**
Set the percentage of burstiness for the primary test profile peak bandwidth. xx equals 0% to 100% in 0.1% steps for OC-3c and OC-12c, and 0.4% steps for DS1 and DS3.

See also: **ATM CELl BANdwidth, ATM RX BANdwidth PERiod, ATM PEAk DURation,** and **SONet INPut**

## ATM PEAk DURation — Transmitted ATM Cell Test Profile Peak Duration Select

**ATM PEA DUR ?**
Print current peak pulse duration for the peak bandwidth. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM PEA DUR x.x**
Set and send peak pulse duration for the peak bandwidth. **x.x** equals 0.1 to 9.9 seconds in 0.1 second steps. The peak pulse duration is sent when the duration is entered.

**ATM PEA DUR STO**
Stop peak pulse duration.

See also: **ATM CELl BANdwidth, ATM RX BANdwidth PERiod, ATM PEAk BANdwidth,** and **SONet INPut**

## ATM PROfile BASe — Set Test Profile Programming Mode

**ATM PRO BAS ?**

Print the current profile programming mode. This command sets the decimal or hexadecimal ATM VPI/VCI addressing to be entered through the **ATM RX PROfile**, **ATM TX PROfile**, and **ATM RX TESt MASk** commands. This command requires the 310-15, 310-17A, or 310-20 options.

**ATM PRO BAS DEC**

Set programming mode for decimal format (00000 to 65535).

**ATM PRO BAS HEX**

Set programming mode for hexadecimal format (0000 to FFFF).

**NOTE**

Changing the programming mode causes a test restart. Changing from one mode to the other automatically converts values for the selected mode; although, when an X is used, the entire field defaults to X.

## ATM PLCp ERRor INSert — DS1/DS3 ATM PLCP Error Insert Control

**ATM PLC ERR INS ?**

Prints current PLCP error insert control status. This command sets or prints either the DS1 or DS3 ATM Physical Layer Convergence Protocol (PLCP) error insert control. The command is only valid when the **MODe** command is set to **M13** or **C-Bit** and the **ATM RATe SELect** command is set to **DS3**, or when the **DS1 Framing** (see **@ MODe** command) is set to **T1 D4, SLC**, or **ESF** and the **ATM RATe SELect** command is set to **DS1.** This command requires the 310-17A option.

**ATM PLC ERR INS SENd**

Send configured ATM PLCP errors.

**ATM PLC ERR INS STOp**

Stop configured ATM PLCP errors.

See also: **ATM PLCp ERRor TYPe, ATM PLCp ERRor RATe, ATM RATe SELect,** and **PATtern**.

## ATM PLCp ERRor RATe — DS1/DS3 ATM PLCP Error Rate Control

**ATM PLC ERR RAT ?**

Prints current PLCP error insert control status. This command sets or prints either the DS1 or DS3 ATM Physical Layer Convergence Protocol (PLCP) error rate control. The command is only valid when the **MODe** command is set to **M13** or **C-Bit** and the **ATM RATe SELect** command is set to **DS3**, or when the **DS1 Framing** (see **@ MODe** command) is set to **T1 D4, SLC**, or **ESF** and the **ATM RATe SELect** command is set to **DS1.** This command requires the 310-17A option.

**ATM PLC ERR RAT [ 3 to 9 or SIN]**

Set PLCP error rate from 3 to 9 or single.

See also: **ATM PLCp ERRor TYPe, ATM PLCp ERRor INSert, ATM RATe SELect,** and **PATtern**.

## ATM PLCp ERRor TYPe — DS1/DS3 ATM PLCP Error Type Control

**ATM PLC ERR TYP ?**

Print current PLCP error type control status. This command sets or prints either the DS1 or DS3 ATM Physical Layer Convergence Protocol (PLCP) error type control. The command is only valid when the **MODe** command is set to **M13** or **C-Bit** and the **ATM RATe SELect** command is set to **DS3**, or when the **DS1 Framing** (see **@ MODe** command) is set to **T1 D4, SLC**, or **ESF** and the **ATM RATe SELect** command is set to **DS1.** This command requires the 310-17A option.

**ATM PLC ERR TYP [ BIP | RDI ]**

Set PLCP error type to either BIP or RDI.

See also: **ATM PLCp ERRor RATe, ATM PLCp ERRor INSert, ATM RATe SELect,** and **PATtern**.

## ATM RATe SELect — ATM Rate Selection Control

**ATM RAT SEL ?**

Prints current rate selection control status. This command sets or prints the ATM rate selection control. This command requires more than one of the following options to be installed: the 310-15, 310-17A, or 310-20 options.

**ATM RAT SEL DS1**

Set rate for DS1.

**ATM RAT SEL DS3**

Set rate for DS3.

**ATM RAT SEL OC3c**

Set rate for OC-3c.

**ATM RAT SEL OC12c**

Set rate for OC-12c.

## ATM RX BANdwidth PERiod — Received ATM Cell Test Profile Bandwidth Select

**ATM RX BAN PER ?**

Print current period for bandwidth measurements being taken. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to receive ATM cells.

**ATM RX BAN PER x.x**

Set period to measure bandwidth from 0.2 seconds to 9.9 seconds in 0.1 second steps.

See also: **ATM CELl BANdwidth, ATM PEAk BANdwidth, ATM PEAk DURation,** and **SONet DROp**

## ATM RX NETwork INTerface — Received ATM Network Interface Select

**ATM RX NET INT ?**

Print current received ATM network interface being tested. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to receive ATM cells.

**ATM RX NET INT NNI**

Configure ATM receiver to receive the network node interface or network-to-network interface cell format.

**ATM RX NET INT UNI**

Configure ATM receiver to receive the user network interface cell format.

See also: **ATM RX SCRamble, ATM TX SCRamble, ATM TX NETwork INTerface,** and **SONet DROp**

## ATM RX PREview — Received ATM Cell Test Profile Preview Select

**ATM RX PRE ?**

Print current ATM preview status. An initial indication of the bandwidth usage and cell type can be monitored through the MASK CELL BW, HEC ERRORS, and ATM Status test results. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to receive ATM cells.

**ATM RX PRE VPI NEX**

Increment VPI to the next detected higher VPI.

**ATM RX PRE VPI PRE**

Decrement VPI to the next detected lower VPI.

**ATM RX PRE VCI NEX**

Increment VCI to the next detected higher VCI.

**ATM RX PRE VCI PRE**

Decrement VPI/VCI to the next detected lower VCI.

See also: **ATM TX TESt PROfile, ATM TX PROfile, ATM RX PROfile, SONet INSert,** and **SONet DROp**

## ATM RX PROfile — Received ATM Cell Test Profile Control

**ATM RX PRO Pn ?**

Print current ATM test profile where **Pn** equals **P1**, **P2**, **P3**, **P4,** or **SEArch**. This command sets or prints the ATM receiver for up to four specific test cell profiles (n = 1 to 4). This enables the ATM cell header fields — GFC, VPI, VCI, PTI, and CLP — to be preprogrammed four different ways with any value. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**NOTE**

SEArch allows users to program the parameter values of the search mask.

**ATM RX PRO Pn <mode, gfc/vpi, vpi, vci, pti, clp>**

**<mode>** — Set the programming mode for the ATM address for either **hex** or **dec**. Selecting the specific mode requires the address to be entered in that format; hexadecimal or decimal.

**<gfc/vpi>** — Set the value for the GFC/VPI fields. For UNI cell format, the GFC range is 0 to F (hex), 00 to 15 (dec), or X. For NNI cell format, this field is used to enter the most significant four bits of the VPI value.

Separate the mode with a space and the other fields with a comma as follows:
hex x,xx,xxxx,x,x or dec x,xx,xxxx,x,x. Select **X** when you don't care what value is received.

**<vpi>** — Set value for the VPI field. For UNI cell format, VPI range is 00 to FF (hex), 000 to 255 (dec), or XXX (256 virtual paths). For NNI cell format, this field contains the least significant 8 bits of the VPI value. The combined GFC/VPI and VPI fields range is 000 to FFF (hex), 0000 to 4096 (dec), or XXXX (4097 virtual paths).

**<vci>** — Set the value for the VCI field. VCI range is 0000 to FFFF (hex), 00000 to 65535 (dec), or X (65,536 virtual channels for each VPI).

**<pti>** — Set the value for the PTI value. PTI range is 0 to 7 (hex or dec) or X. PTI value defined as follows:

0 - User Data Cell, congestion not experienced, SDU-type.

1 - User Data Cell, congestion not experienced, SDU-type.

2 - User Data Cell, congestion experienced, SDU-type.

3 - User Data Cell, congestion experienced, SDU-type.

4 - Segment OAM F5 flow cell (for VC loop backs and alarms).

5 - End-to-end OAM F5 flow cell (for VC loop backs and alarms).

6 - Reserved for future traffic control and remote monitoring functions.

7- Reserved for future functions.

X - Don't care what value is received.

**<clp>** — Set the CLP value, CLP range is 0 or 1 (hex or dec) or X. 1 allows cell to be classified low priority and may be dropped. 0 classifies the cell as high priority and usually prevents cell from being dropped. ATM switches can change the CLP value when they detect congestion.

See also: **ATM TX TESt PROfile, ATM TX PROfile, ATM RX TESt MASk, SONet INPut,** and **SONet DROp**

## ATM RX SCRamble — Receiver 43-Bit Cell Payload Descrambler Control

**ATM RX SCR ?**

Print current configuration of the receiver 43-bit cell descrambler. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to receive ATM cells.

**ATM RX SCR OFF**

Disable receiver 43-bit cell payload descrambler.

**ATM RX SCR ON**

Enable receiver 43-bit cell payload descrambler.

See also: **ATM RX NETwork INTerface, ATM TX SCRamble, ATM TX NETwork INTerface,** and **SONet DROp**

## ATM RX TESt MASk — Received ATM Cell Test Mask Control

**ATM RX TES MAS ?**

Print current cell test mask format to look for in the received signal. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to receive ATM cells.

**ATM RX TES MAS AIS SEA**

Search for the transmitted OA&M test cell.

**ATM RX TES MAS SEA**

Use the Search Mask to perform Results Analysis.

**ATM RX TES MAS Pn**

Selects the cell profile. **Pn** can be P1 to P4.

**ATM RX TES MAS PRE**

Enter Preview Mode.

**ATM RX TES MAS PRE USE**

Store the current VPI/VCI detected in Preview mode as the Search Profile.

**ATM RX TES MAS PRE NEX**

Increments to the next VPI/VCI in Preview Mode.

**ATM RX TES MAS RDI SEA**

Search for the transmitted OA&M RDI test cell.

**ATM RX TES MAS TTC SEA**

Search for the transmitted OA&M TTC test cell.

**ATM RX TES MAS TX**

Selects the signal transmitted from the T-BERD 310 as the received mask.

**ATM RX TES MAS AIS NEX**

Increment to the next VPI/VCI in the AIS Search Mode.

**ATM RX TES MAS RDI NEX**

Increment to the next VPI/VCI in the RDI Search Mode.

**ATM RX TES MAS TTC NEX**

Increment to the next VPI/VCI in the TTC Search Mode.

**ATM RX TES MAS AIS USE**

Store the current VPI/VCI detected in AIS Search Mode as the Search Profile.

**ATM RX TES MAS RDI USE**

Store the current VPI/VCI detected in RDI Search Mode as the Search Profile.

**ATM RX TES MAS TTC USE**

Store the current VPI/VCI detected in TTC Search Mode as the Search Profile.

**ATM RX TES MAS RES NOR**

Set the receiver to normal results analysis mode.

**ATM RX TES MAS RES CDV**

Set the receiver to delay variation results analysis mode.

**ATM RX TES MAS RES ?**

Returns the current setting for the receiver results analysis mode. Possible values are normal and delay variation.

See also: **ATM TX TESt PROfile, ATM TX PROfile, ATM RX PROfile, SONet INSert**, and **SONet DROp**

## ATM TX NETwork INTerface — Transmitted ATM Network Interface Select

**ATM TX NET INT ?**

Print current transmitted ATM network interface to be tested. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM TX NET INT NNI**

Configure ATM transmitter to send the network node interface or network-to-network interface cell format.

**ATM TX NET INT UNI**

Configure ATM transmitter to send the user network interface cell format.

See also: **ATM RX NETwork INTerface, ATM TX SCRamble, SONet DROp,** and **SONet INPut**

## ATM TX PROfile — Transmitted ATM Cell Test Profile Control

**ATM TX PRO Pn ?**

Print the current ATM test profile where **Pn** equals **P1**, **P2**, **P3**, or **P4**. This command sets or prints the four specific test cell profiles (n = 1 to 4). This enables the ATM cell header fields — GFC, VPI, VCI, PTI, and CLP — to be preprogrammed four different ways with any value. The test profiles are selected and transmitted with the **ATM TX TESt PROfile** command. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM TX PRO Pn <mode, gfc/vpi, vpi, vci, pti, clp>**

**<mode>** — Set the programming mode for the ATM address for either **hex** or **dec**. Selecting the specific mode requires the address to be entered in that format; hexadecimal or decimal.

**<gfc/vpi>** — Set the value for the GFC/VPI fields. For UNI cell format, the GFC range is 0 to F (hex), 00 to 15 (dec), or X. For NNI cell format, this field is used to enter the most significant four bits of the VPI value.

**<vpi>** — Set value for the VPI field. For UNI cell format, VPI range is 00 to FF (hex) or 000 to 255 (dec) (256 virtual paths). For NNI cell format, this field contains the least significant 8 bits of the VPI value. The combined GFC/VPI and VPI fields range is 000 to FFF (hex), 0000 to 4096 (dec), or XXXX (4097 virtual paths).

**<vci>** — Set the value for the VCI field. VCI range is 0000 to FFFF (hex) or 00000 to 65535 (dec) (65,536 virtual channels for each VPI).

**<pti>** — Set the value for the PTI value. PTI range is 0 to 7 (hex or dec). PTI value defined as follows:

0 - User Data Cell, congestion not experienced, SDU-type.

1 - User Data Cell, congestion not experienced, SDU-type.

2 - User Data Cell, congestion experienced, SDU-type.

3 - User Data Cell, congestion experienced, SDU-type.

4 - Segment OAM F5 flow cell (for VC loop backs and alarms).

5 - End-to-end OAM F5 flow cell (for VC loop backs and alarms).

6 - Reserved for future traffic control and remote monitoring functions.

7- Reserved for future functions.

X - Don't care what value is received.

**<clp>** — Set the CLP value, CLP range is 0 or 1 (hex or dec). 1 allows cell to be classified low priority and may be dropped. 0 classifies the cell as high priority and usually prevents cell from being dropped. ATM switches can change the CLP value when they detect congestion.

See also: **ATM TX TESt PROfile, ATM RX TESt MASk, ATM RX PROfile, SONet INSert, SONet INPut,** and **PATtern**

## ATM TX SCRamble — Transmitter 43-Bit Cell Payload Scrambler Control

**ATM TX SCR ?**

Print current configuration of the transmitter 43-bit cell payload scrambler. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM TX SCR OFF**

Disable transmitter 43-bit cell payload scrambler.

**ATM TX SCR ON**

Enable transmitter 43-bit cell payload scrambler.

See also: **ATM RX SCRamble, ATM TX NETwork INTerface,** and **SONet INPut**

## ATM TX TESt PROfile — Transmitted ATM Cell Test Profile Select

**ATM TX TES PRO ?**

Print current ATM test profiles to be transmitted. The test profiles are created with the **ATM TX PROfile** command. This command requires the 310-15, 310-17A, or 310-20 option. The command is only valid when the test set is configured to transmit ATM cells.

**ATM TX TES PRO Pn**

Select test profile to be transmitted. **Pn** equals **P1** to **P4**.

See also: **ATM TX PROfile, ATM RX TESt MASk, ATM RX PROfile, SONet INSert,** and **SONet INPut**

## BEEp CRIteria — Set Beep Criteria

**BEE CRI ?**

Print current beep criteria status for specific events.

**BEE CRI ALL [ ON | OFF ]**

Enable/Disable all of the beep criterion.

**BEE CRI ERR EVE [ ON | OFF ]**

Enable/Disable T-BERD 310 to beep on an error event.

**BEE CRI PAT SYN [ ON | OFF ]**

Enable/Disable T-BERD 310 to beep on pattern synchronization.

**BEE CRI THR ERR SEC [ ON | OFF ]**

Enable/Disable T-BERD 310 to beep on an errored second.

**BEE CRI DS1 SCANTRIG [ ON | OFF ]**
Enable/Disable T-BERD 310 to beep when an event specified in the **@SCAn TRIgger** command occurs during a triggered DS1 scan mode test. This command requires the 310-1 option.

## BLUe SIGnal CRIteria — Set Blue Signal Detection Criteria

**BLU SIG CRI ?**
Print current Blue Signal detection criteria. Changing command parameter causes a test restart.

**BLU SIG CRI 1010**
Set Blue Signal detection to the 1010 criteria.

**BLU SIG CRI STU C**
Set Blue Signal detection to the stuck C-bit criteria.

## CLEar PRInt BUFfer — Clear Print Buffer

**CLE PRI BUF**
This command clears all printouts from the print buffer.

## CLS — Clear Terminal Screen

**CLS**
This command clears the terminal screen with 30 carriage returns.

## CONtrols — Generate Controls Printout

**CON**
This command generates a controls printout of the T-BERD 310 front panel configuration. The **PRInt CONtrols** command performs the same function.

See also: **PRInt CONtrols**

## DISplay HOLd — Set Display Hold

**DIS HOL ?**
Print current display hold status.

**DIS HOL ON**
Activate display hold function. The results and Status and Alarm LEDs are frozen.

**DIS HOL OFF**
Disable display hold function. The results and Status and Alarm LEDs are released and updated.

**NOTE**

While **DISplay HOLd** command is ON, updated results can be checked with the **RES1** or **RES2** command.

See also: **PRInt** and **RESUlts**

---

**DISplay** — **Set RESULTS Switches Control**

**DIS ?**
Print current **RESULTS** switches control status on the T-BERD 310 and 310-1.

**DIS LOC**
Set **RESULTS** switches for local front-panel and remote control operation.

**DIS REM**
Set **RESULTS** switches for remote control operation only.

---

**DS1 BITs CLK** — **DS1 BITS Clock Termination**

**DS1 BIT CLK ?**
Print current DS1 BITS CLOCK connector input termination. This command requires the 310-13T or 310-14T option.

**DS1 BIT CLK TER**
Select to terminate an unterminated input signal across 100 ohms.

**DS1 BIT CLK BRI**
Select to terminate input signal across 1000 ohms to bridge terminated lines.

---

**DS1 DROp CHAnnel** — **Set Dropped DS1/E1 Channel**

**DS1 DRO CHA ?**
Print current dropped DS1/E1 channel.

**DS1 DRO CHA [ 1 | 2 to 28 ]**
Select DS1 channel to be dropped. DS1 channels are entered with numbers from 1 to 28.

**DS1 DRO CHA [ E1 | E2 to E21 ]**
Select E1 channel to be dropped. E1 channels are entered with numbers from E1 to E21. This command requires the 310-2 option.

**NOTE**

When AIS indication is detected on the dropped DS1 channel, three decimal points appear in the **DS3-DS1 CHANNEL DROP** switch display. This indication is not reported during remote control operation.

## DS1 DROp OUT — Set Dropped DS1 Channel Source

**DS1 DRO OUT ?**
Print current dropped DS1 channel source status (DS3 or SONET) for the side-panel DS1 DROP jack. Requires a SONET option.

**DS1 DRO OUT DS3**
Set dropped DS1 channel source to the received DS3 signal. The DS1 signal is dropped from the DS3 RECEIVE jack.

**DS1 DRO OUT SON**
Set dropped DS1 channel source to the received SONET signal. The DS1 signal is dropped from the side-panel STS-1, OC-1/3/3c, or OC-12 RECEIVE connection depending on the installed SONET option.

## DS1 INSert CHAnnel — Set DS1 Insert Channel

**DS1 INS CHA ?**
Print current inserted DS1 channel selection. The command is also used to insert a DS1 channel into the secondary DS3 signal when the DS1 INSERT mode is selected.

**DS1 INS CHA [ 1 | 2 to 28 ]**
Select DS1 channel into which the DS1 signal is to be inserted.

**DS1 INS CHA ALL**
Insert DS1 signal into all DS1 channels. This command only applies to MUXED M13 and MUXED C-BIT modes.

**DS1 INS CHA NON**
No DS1 channels are inserted. In the MUXED modes, this command leaves an All Ones pattern in all the DS1 channels. In the DS1 INSERT mode (requires 310-3 option), the command allows the entire secondary DS3 signal to pass unaffected and prevents the DS1 signal from being inserted.

See also: **MODe**

## DS1 LINecode — Set DS1 Transmitted Line Coding

**DS1 LIN ?**
Print current DS1 line coding for the side-panel DS1 DROP output jack.

**DS1 LIN AMI**
Set DS1 line code to AMI.

**DS1 LIN B8Z**
Set DS1 line code to B8ZS.

## DS1 LP CODe — Set DS1 Loop Code Type

**DS1 LP COD ?**
Print current transmitted DS1 loop code type. The command only applies when operating in the MUXED M13 or MUXED C-BIT mode and the T1D4 or T1ESF LPUP or LPDN pattern is selected.

**DS1 LP COD CSU**

Set DS1 loop code type to CSU. The loop-up code is 10000 and the loop-down code is 100.

**DS1 LP COD FAC1**

Set DS1 loop code type to Facility 1. The loop-up code is 1100 and the loop-down code is 1110.

**DS1 LP COD FAC2**

Set DS1 loop code type to Facility 2. The loop-up code is 11000 and the loop-down code is 11100.

**DS1 LP COD PGM**

Set loop code type to Programmable. Use the **PGM LPDn** and **PGM LPUp** commands to program the loop codes.

See also: **MODe, PGM LPUp,** and **PGM LPDn**

## DS1 SIGnaling BITs — DS1 Signaling Bits Transfer Mode

**DS1 SIG BIT ?**

Print current DS1 signaling bits transfer mode for DS1 signals carried in the VT1.5 byte-synchronous channel. The selected function affects both drop and insert signals. The **SONet INSert DS1 BYTe** command must be selected to make this command functional. This command requires the 310-13R, 310-13T, 310-14R, or 310-14T option.

**DS1 SIG BIT PAS**

Select to allow the embedded DS1 signaling bits (if any) to pass through with the DS1 signal. This is appropriate for clear channel DS0s.

**DS1 SIG BIT OUT**

Select to allow out-of-slot DS1 signaling. On inserted DS1 signal, the DS1 signaling bits are removed and placed within the VT overhead. On dropped DS1 signal, the DS1 signaling bits are inserted into the DS1 robbed bit frames.

See also: **SONet INSert**

## DS1 VT MAP — DS1/VT Mapping Select

**DS1 VT MAP ?**

Print current DS1/VT mapping being used in the **SONet INSert** and **SONet DROp** commands.

**DS1 VT MAP M13**

Enables DS1 signals to be selected sequentially through the seven VT1.5 groups with the first four channels in the first group, the second four channels in the second group, and so forth.

**DS1 VT MAP TR-253**

Enables DS1 signals to be selected sequentially through the seven VT1.5 groups with the first channel in each first group numbered first, the second four channels in the second group, and so forth.

**DS1 VT MAP SEQ**

Enables DS1 signals to be selected sequentially using DS1 channel numbers from 1 to 28.

See also: **SONet INSert** and **SONet DROp**

## DS3 SOUrce — Set DS3 Input Source

**DS3 SOU ?**
Print current DS3 input source status. Requires a SONET option.

**DS3 SOU EXT**
Set DS3 input source to the DS3 RECEIVE jack.

**DS3 SOU SON**
Set DS3 input source to the DS3 signal dropped out of a side-panel STS-1, OC-1/3/3c, or OC-12 RECEIVE connection (depends on installed SONET option).

## ECHo — Set Terminal Echo Mode

**ECH ?**
Print current terminal echo mode.

**ECH ON**
Enable terminal echo mode. All characters entered from a terminal are echoed back from the T-BERD 310. The command is automatically enabled in terminal mode.

**ECH OFF**
Disable terminal echo mode. All characters entered from a terminal are *not* echoed back from the T-BERD 310. The command is automatically disabled in remote mode.

See also: **REMote** and **TERminal**

## ERRor INSert BPV — Execute BPV Insertion

**ERR INS BPV ?**
Print current BPV insertion setting.

**ERR INS BPV OFF**
Disable continuous BPV insertion.

**ERR INS BPV BUR**
Insert a burst of BPVs. Set burst length with the **LOG/bpv BURst** command. Set insertion rate with the **LOG/bpv RT** command.

**ERR INS BPV RAT**
Insert continuous BPVs. Set insertion rate with the **LOG/bpv RT** command.

**ERR INS BPV SIN**
Insert a single BPV.

See also: **LOG/bpv BURst** and **LOG/bpv RT**

## ERRor INSert FRAme — Execute Frame Error Insertion

**ERR INS FRA ?**
Print current DS3 frame error insertion setting.

**ERR INS FRA OFF**
Stop all frame error insertion.

**ERR INS FRA MUL**
Insert multiple frame errors into one M-frame. Set number of frame errors with the **FRAme ERRor** command.

**ERR INS FRA CON**
Insert multiple frame errors continuously. Set number of frame errors with the **FRAme ERRor** command.

**ERR INS FRA SIN**
Insert a single frame error.

See also: **FRAme ERRor**

## ERRor INSert LOGic — Execute Logic Error Insertion

**ERR INS LOG ?**
Print current DS3 logic error insertion setting.

**ERR INS LOG OFF**
Disable continuous logic error insertion.

**ERR INS LOG BUR**
Insert a burst of logic errors. Set burst duration with the **LOG/bpv BURst** command. Set insertion rate with the **LOG/bpv RT** command.

**ERR INS LOG RAT**
Insert continuous logic errors. Set insertion rate with the **LOG/bpv RT** command.

**ERR INS LOG SIN**
Insert a single logic error.

See also: **LOG/bpv BURst** and **LOG/bpv RT**

## ERRor THReshold — Set Errored Second Threshold

**ERR THR ?**
Print current DS3 errored second threshold status for the BIT THR ES, FRM THR ES, and BPV THR ES results.

**ERR THR [ 1E-2 | 1E-3 to 1E-7 ]**
Set errored second threshold from 1E-2 to 1E-7.

## FEAc ALArms — FEAC Message Alarm Control

**FEA ALA ?**
Print current Far-End Alarm and Control (FEAC) alarm status. The alarm message is transmitted for 1 second. Set **MODe** command to **C-Bit** to send FEAC alarms.

**FEA ALA STO**
Halt selected FEAC alarm message.

**FEA ALA DS3 EQU FAI SA**
Select and send DS3 Equipment Failure, Service Affecting (Type 1 equipment failure) alarm message.

**FEA ALA DS3 LOS**
Select and send DS3 Loss-of-Signal/High Bit Error Ratio alarm message.

**FEA ALA DS3 OUT OF FRA**
Select and send DS3 Out-of-Frame, Loss of DS3 Frame Synchronization alarm message.

**FEA ALA DS3 AIS REC**
Select and send DS3 Alarm Indication Signal Received alarm message.

**FEA ALA DS3 IDL REC**
Select and send DS3 Idle Signal Received alarm message.

**FEA ALA DS3 EQU FAI NSA**
Select and send DS3 Equipment Failure, Non-Service Affecting (Type 2 equipment failure) alarm message.

**FEA ALA COM EQU FAI NSA**
Select and send Common Equipment Failure, Non-Service Affecting (Type 2 equipment failure) alarm message.

**FEA ALA MUL DS1 LOS**
Select and send Multiple DS1 Loss-of-Signal/High Bit Error Ratio alarm message.

**FEA ALA DS1 EQU FAI SA**
Select and send DS1 Equipment Failure, Service Affecting (Type 1 equipment failure) alarm message.

**FEA ALA SIN DS1 LOS**
Select and send Single DS1 Loss-of-Signal/High Bit Error Ratio alarm message.

**FEA ALA DS1 EQU FAI NSA**
Select and send DS1 Equipment Failure, Non-Service Affecting (Type 2 equipment failure) alarm message.

See also: **FEAc LOOp** and **MODe**

## FEAc LOOp — FEAC Message Loopback Control

**FEA LOO ?**
Print current FEAC message loop code status. Set **MODe** command to **C-Bit** to send FEAC message loop codes.

**FEA LOO UP DS3 LIN**
Select and send DS3 line loop-up code.

**FEA LOO DOW DS3 LIN**
Select and send DS3 line loop-down code.

**FEA LOO UP ALL DS1s**
Select and send DS1 line loop-up code to loop up all low-speed DS1 channels.

**FEA LOO DOW ALL DS1s**
Select and send DS1 line loop-down code to loop down all low-speed DS1 channels.

**FEA LOO UP DS1 [ 1 | 2 to 28 ]**
Select and send DS1 line loop-up code to loop up indicated low-speed DS1 channel.

**FEA LOO DOW DS1 [ 1 | 2 to 28 ]**

Select and send DS1 line loop-down code to loop down indicated low-speed DS1 channel.

**FEA LOO UP DS3 NIU**

Select and send DS3 NIU loop-up code.

**FEA LOO DOW DS3 NIU**

Select and send DS3 NIU loop-down code.

See also: **FEAc ALArms** and **MODe**

## FIRST POWERUP — Restore T-BERD 310 to Factory Defaults/Retained Settings

**FIRST POWERUP**

This command reinitializes the T-BERD 310 (and all options) to its factory default settings and/or it allows the unit to retain prior settings for print device, print baud rate, parity, line terminator, and IEEE-488 address. It also takes the instrument out of remote control.

## FRAme ERRor — Set Number of M-Frame Errors Inserted

**FRA ERR ?**

Print current number of frame errors per M-frame to be inserted when the **ERRor INSert FRAme** command is used.

**FRA ERR [ 1 | 2 ]**

Set number of frame errors per M-frame from 1 to 2.

See also: **ERRor INSert FRAme**

## FRaMe LOSs THReshold — Set Frame Synchronization Loss Threshold

**FRM LOS THR ?**

Print current DS3 frame synchronization loss threshold.

**FRM LOS THR 3**

Set threshold to 3 frame errors out of 15 framing bits received.

**FRM LOS THR 6**

Set threshold to 6 frame errors out of 15 framing bits received.

## HELLO — Display T-BERD 310 Software and Hardware Revision Levels

**HELLO**

Print current software revision level and installed options of the T-BERD 310. This information is useful to verify the T-BERD 310 configuration before calling TTC for assistance.

EXAMPLE:

```
> HELLO

Software version E.02 11/05/94

Installed boards/options and module codes:

   PROCESSOR     BOARD: Module code = 01
   IEEE-488     OPTION: Not installed
   TRANSMITTER   BOARD: Module code = 00
   RECEIVER      BOARD: Module code = 00
   FRAMING       BOARD: Module code = 00
   E1 DROP      OPTION: Installed
   DS1 BERTS    OPTION: Module code = 02
   ENHANCED ESF OPTION: Module code = 02
   DS1 INSERT   OPTION: Not installed
   SONET DROP   OPTION: Not installed
   SONET DROP FPGA    : Not installed
   OPTICAL I/F  OPTION: Not installed
   JITTER       OPTION: Not installed
   DS3 USER I/F  BOARD: Module code = 00
   DS1 USER I/F OPTION: Module code = 00
   G.821 RESLTS OPTION: Installed
   SONET RCVR   OPTION: Module code = 00
   SON RCVR OPTIC  OPT: Installed
   SON RCVR FPGA      : Module code = 1E
   SONET XMIT   OPTION: Module code = 00
   SON XMIT OPTIC  OPT: Installed
   SON XMIT FPGA      : Module code = 10
   SONET OC-12  OPTION: Module code = 00

>
```

## HELP — Display On-Line Help

**HELP (?)**

Use **HELP** or **?** to print introduction to the T-BERD 310 on-line help pages. The help page identifies command syntax for entering commands and a list of available help page commands. The "**?**" can be used in place of **HELP** in the following commands. Use page number (e.g., **? 4**) or page name (e.g., **? FRO**) to select the required help page.

**HELP !**

List all available T-BERD 310 remote control commands.

**HELP [ 0 | MIS ]**

List T-BERD 310 (and 310-1) miscellaneous remote control commands.

**HELP [ 1 | FRO ]**

List T-BERD 310 front-panel remote control commands.

**HELP [ 2 | AUX1 ]**

List page 1 of T-BERD 310 auxiliary function remote control commands.

**HELP [ 3 | AUX2 ]**

List page 2 of T-BERD 310 auxiliary function remote control commands.

**HELP [ 4 | MAI ]**

List remote control commands that affect the operation of T-BERD 310 (and 310-1).

**HELP [ 5 | 232/488 ]**

List remote control commands that affect the operation of RS-232 and IEEE-488 (requires 310-6 option) interfaces.

**HELP <command-name>**

Describe **<command-name>** and any parameters in detail.

See also: **@HELp**

## HIStory RESet — Clear History Alarm LEDs

**HIS RES**

Clear any illuminated Primary (and Secondary) History Alarm LED.

EXAMPLE:

```
> LED (Print state of Status and Alarm LEDs.)

            - alarms -                          |          - status -
    primary                     secondary       | primary              secondary
    ON   ON   signal    loss    OFF  OFF        |   OFF   signal    present  OFF
    ON   ON   frame     loss    OFF  OFF        |   OFF   frame     sync     OFF
    OFF  ON   ds2 frame loss    OFF  OFF        |   OFF   c-bit     frame    OFF
    OFF  OFF  pattern   loss                    |   OFF   idle      present  OFF
    OFF  OFF  blue      (AIS)   OFF  OFF        |   OFF   ds2 frame sync     OFF
    OFF  OFF  yellow            OFF  OFF        |   OFF   pattern   sync
    OFF  OFF  far-end   alarm   OFF  OFF        |   OFF   sonet     present
   OFF  OFF  sonet     loss                    |
   OFF       power     loss

        _________ history _________|
```

```
> HIS RES (Reset History Alarm LEDs.)
> LED (Print state of Status and Alarm LEDs.)
```

```
|              - alarms -                  |            - status -
|    primary                  secondary    | primary              secondary
|    OFF  OFF  signal    loss  OFF  OFF    |   ON    signal    present  OFF
|    OFF  OFF  frame     loss  OFF  OFF    |   ON    frame     sync     OFF
|    OFF  OFF  ds2 frame loss  OFF  OFF    |   ON    c-bit     frame    OFF
     OFF  OFF  pattern   loss        |     |   OFF   idle      present  OFF
     OFF  OFF  blue      (AIS) OFF  OFF    |   ON    ds2 frame sync     OFF
|    OFF  OFF  yellow          OFF  OFF    |   OFF   pattern   sync
|    OFF  OFF  far-end   alarm OFF  OFF    |   OFF   sonet     present
|    OFF  OFF  sonet     loss        |     |_____________________________|
|    OFF       power     loss        |     |
      |                                |
      |__________  history ____________|     |
 ____________________________________________|
>
```

## HOLd — Hold All Printer Output

**HOL**

This command places a temporary hold on the following print buffer outputs: result prints, controls prints, and alarm, status, and note messages. When command is executed, the prompt changes from the "**>**" (greater than) or user-defined prompt to a "**+**" (plus). The "**+**" indicates that the print buffer is temporarily on hold.

When the "**+**" prompt appears, command responses (except for **CONtrols** and **RESUlts**), help pages, and syntax error messages continue to be generated. The results, controls, and message printouts are generated and stored in the print buffer.

Use the **RELease** command to release print buffer and print all stored printouts. Turning power off and on performs the same function as the **RELease** command.

See also: **RELease** and **PROmpt**

## JITter FILter — Set Jitter Bandpass Filter

**JIT FIL ?**

Print current jitter bandpass function status for the jitter test results. This command requires the 310-5 option.

**JIT FIL WID**

Select wideband filter (10 Hz to 400 kHz).

**JIT FIL HIG**

Select highband filter (30 kHz to 400 kHz).

**JIT FIL AUT**

Select automatic bandpass filter function. This selection alternates between both filters to provide continuous measurement for both frequency ranges.

See also: **JITter SCAle** and **JITter THReshold**

## JITter SCAle — Set Jitter Amplitude Scale

**JIT SCA ?**

Print current jitter amplitude scale status for the jitter test results. Enter the scale parameter by the number itself, e.g., **2**, **5**, or **20**, or by the complete parameter, e.g., **2 UI P-P**. This command requires the 310-5 option.

**JIT SCA 2**

Set scale to the 2 UIp-p range.

**JIT SCA 5**

Set scale to the 5 UIp-p range.

**JIT SCA 20**

Set scale to the 20 UIp-p range.

**JIT SCA AUT**

Set scale for autoranging. This command selects the appropriate scale for the most accurate measurements.

See also: **JITter FILter** and **JITter THReshold**

## JITter THReshold — DS3 Jitter Threshold Select

**JIT THR ?**

Print current jitter threshold for the HB JIT or WB JIT test results. When the threshold is exceeded, the test result appears in the Summary category. This command requires the 310-5 option.

**JIT THR <threshold>**

Set jitter **<threshold>** as follows:

0.01 to 0.05 in 0.01 UI steps.

0.05 to 0.2 in 0.05 UI steps.

0.2 to 1.0 in 0.2 UI steps.

1.0 to 5.0 in 0.5 UI steps.

5.0 to 20.0 in 5.0 UI steps.

See also: **JITter FILter** and **JITter SCAle**

## LASt ERRor — Print Last Error Message

### LAS ERR

This command prints and clears the last error message generated by remote control.

EXAMPLE:

```
> LAS ERR

*** ERROR: Remote Control cannot modify this setting.
> LAS ERR

No Error.
```

## LCD CONtrast — Set 310-1 LCD Contrast

### LCD CON ?

Print current contrast setting for the 310-1 display. This command is only available on newer 310-1 options.

### LCD CON [ 1 to 10 ]

Adjust 310-1 display viewing between ten different levels of contrast.

## LEDs — Print State of Status and Alarm LEDs

### LED

This command prints the state of the Status and Alarm LEDs.

EXAMPLE:

```
> LED

                - alarms -                          |          - status -
    primary                     secondary           | primary                secondary
    ON   ON   signal    loss    OFF   OFF           |   OFF   signal    present   OFF
    ON   ON   frame     loss    OFF   OFF           |   OFF   frame     sync      OFF
    OFF  ON   ds2 frame loss    OFF   OFF           |   OFF   c-bit     frame     OFF
    OFF  OFF  pattern   loss                        |   OFF   idle      present   OFF
    OFF  OFF  blue      (AIS)   OFF   OFF           |   OFF   ds2 frame sync      OFF
    OFF  OFF  yellow            OFF   OFF           |   OFF   pattern   sync
    OFF  OFF  far-end   alarm   OFF   OFF           |   OFF   sonet     present
    OFF  OFF  sonet     loss                        |
    OFF       power     loss                        |
                                                    |
          |_________  history _________|

>
```

## LOCal — Return Control to the Front Panel

**LOC (*/*)**

This command returns the T-BERD 310 (and 310-1) to local front panel control from terminal or remote mode. The message *232 REMOTE CONTROL* stops flashing in the MODE/PATTERN window. The T-BERD 310 always monitors the remote control interface for commands from the remote control device. When any command is received, the T-BERD 310 goes into remote mode.

See also: **TERminal** and **REMote**

## LOG/bpv BURst — Set Logic/BPV Burst Duration

**LOG BUR ?**

Print current logic error or BPV insertion burst duration.

**LOG BUR [ 0.025 | 0.050 to 5.0 ]**

Set burst duration from 0.025 to 1.0 second in 0.025 second steps and from 1.0 to 5.0 seconds in 0.100 second steps. For whole seconds (1 to 5), drop the zero.

**LOG BUR [ 25 | 50 to 5000 ]**

Set burst duration from 25 to 1000 ms in 25 ms steps and from 1000 to 5000 ms in 100 ms steps.

**LOG BUR SIN**

Set burst duration for a single logic error or BPV.

See also: **ERRor INSert BPV** and **ERRor INSert LOGic**

## LOG/bpv RT — Set Logic/BPV Error Insertion Rate

**LOG RT ?**

Print current DS3 logic error or BPV insertion rate.

**LOG RT [ 1E-2 | 1E-3 to 1E-9 ]**

Set insertion rate from 1E-2 to 1E-9.

See also: **ERRor INSert BPV** and **ERRor INSert LOGic**

## MODe — Set Transmit and Receive Operating Mode

**MOD ?**

Print current DS3 transmit and receive operating mode.

**MOD AUT**

Select automatic configure frame and pattern mode.

**MOD C-B**

Select DS3 C-bit parity frame formatted mode.

**MOD DS1 INS**

Select DS1 INSERT mode.

**MOD M13**

Select DS3 M13 frame formatted mode.

**MOD MUX C-Bit**
Select demultiplexable DS3 C-bit frame formatted mode.

**MOD MUX M13**
Select demultiplexable DS3 M13 frame formatted mode.

**MOD THR**
Select through mode.

**MOD UNF**
Select unframed DS3 mode.

See also: **PATTern**

## OPTical POWer WAVelength — Optical Power Measurement Wavelength Select

**OPT POW WAV ?**
Print current optical power measurement wavelength for the POWER METER connector. This command requires the 310-16 option.

**OPT POW WAV 1310**
Select 1310 nm wavelength for the optical power detector and optical power measurement test result.

**OPT POW WAV 1550**
Select 1550 nm wavelength for the optical power detector and optical power measurement test result.

## OPTical RETurn LOSs REFerence — Optical Return Loss Measurement Reference Control

**OPT RET LOS REF ?**
Print current use of the RETURN LOSS/SOURCE connector. This command sets the return loss measurement reference when the **OPTical RETurn LOSs TYPe** command is set to **REFerence**. This command requires the 310-16 option.

**OPT RET LOS REF CLE**
Clear the stored return loss offset from the RETURN LOSS/SOURCE connector.

**OPT RET LOS REF SET**
Measure and store the return loss of the RETURN LOSS/SOURCE connector. Before executing the command, wrap the fiber cable in a tight loop around a pencil 5 to 10 times to create a mandrel wrap. The mandrel wrap cancels out the fiber and allows the T-BERD 310 to measure the return loss of the RETURN LOSS/SOURCE connector. Unwrap the fiber to measure the return loss of the cable.

See also: **OPTical SOUrce** and **OPTical RETurn LOSs TYPe**

## OPTical RETurn LOSs TYPe — Optical Return Loss Measurement Type Select

**OPT RET LOS TYP ?**
Print current use of the RETURN LOSS/SOURCE connector. This command sets the type of return loss measurement being performed when the **OPTical SOUrce** command is set to **1310** or **1550**. This command requires the 310-16 option.

**OPT RET LOS TYP ABS**

Configure the return loss measurement to measure all return loss starting with the RETURN LOSS/SOURCE connector.

**OPT RET LOS TYP REF**

Configure the return loss measurement to measure all return loss except from the RETURN LOSS/SOURCE connector. Set stored reference with the **OPTical RETurn LOSs REFerence** command.

See also: **OPTical SOUrce** and **OPTical RETurn LOSs REFerence**

## OPTical SOUrce — Optical Stable Source Select

**OPT SOU ?**

Print current use of the RETURN LOSS/SOURCE connector. This command sets the wavelength of the RETURN LOSS/SOURCE connector. Use the **OPTical RETurn LOSs TYPe** command to set return loss type. This command requires the 310-16 option.

**OPT SOU 1310**

Select 1310 nm wavelength for the RETURN LOSS/SOURCE connector and return loss measurement test result.

**OPT SOU 1550**

Select 1550 nm wavelength for the RETURN LOSS/SOURCE connector and return loss measurement test result.

**OPT SOU OFF**

Disable the RETURN LOSS/SOURCE connector.

See also: **OPTical RETurn LOSs**

## ORDerwire — Orderwire Channel Control

**ORD ?**

Print current in-use orderwire channel. This command sets the drop and insert capabilities for the appropriate orderwire channel. The orderwire channel is accessed through the HANDSET connector. This command requires the 310-13T or 310-14T option and is limited to orderwire insert only. The 310-13R/T pair or 310-14R/T pair option is required for full orderwire drop and insert capabilities.

**ORD NON**

Disable the drop of either orderwire channel. A quiet tone is placed in the transmitted Line and Section orderwire channel.

**ORD LIN**

Select Line orderwire channel to be dropped and inserted.

**ORD SEC**

Select Section orderwire channel to be dropped and inserted.

## PARity ERRor RT — Set Parity Error Rate Calculation Criteria

**PAR ERR RT ?**
Print current PARITY error rate calculation criteria.

**PAR ERR RT BIT ERR**
Set PARITY error rate calculation criteria to BIT error mode.

**PAR ERR RT BLO ERR**
Set PARITY error rate calculation criteria to BLOCK error mode.

## PATH TRAce — Path Trace Message Insertion Control

**PATH TRA ?**
Print current path trace message number (USER 1, 2, or 3). This command sets one of three default or user-defined messages to be transmitted over the path trace byte (J1) of the currently inserted STS-1 signal. The path trace message is a 64-character ASCII message which includes alphanumeric characters, spaces, null characters, and CR/LF line terminator.

The user-defined messages can be up to 62-characters long. The T-BERD 310 automatically pads the transmitted message with nulls and the CR/LF line terminator to make up the 64-character message. The default message strings are 64-characters long.

This command requires the 310-13T or 310-14T option to insert the message. The 310-13R/T pair or 310-14R/T pair option is required for full drop and insert path trace capabilities.

**PATH TRA USER1**
Send the current USER1 path trace message.

**PATH TRA GET USER1 ?**
Print current USER1 path trace messages.

**PATH TRA SET USER1 <text>**
Enter a user-defined path trace message for USER1.

**PATH TRA USER2**
Send the current USER2 path trace message.

**PATH TRA GET USER2 ?**
Print current USER2 path trace messages.

**PATH TRA SET USER2 <text>**
Enter a user-defined path trace message for USER2.

**PATH TRA USER3**
Send the current USER3 path trace message.

**PATH TRA GET USER3 ?**
Print current USER3 path trace messages.

**PATH TRA SET USER3 <text>**
Enter a user-defined path trace message for USER3.

The default messages include the following:

**USER1** — The quick brown fox jumps over the lazy dog 1234567890 !@#$%&*

**USER2** — Telecommunications Techniques Corporation... Expect Excellence

**USER3** — T-BERD 310: Communications Analyzer for SONET, DS3, DS1, & DS0

## PATTern LOSs THReshold — Set Pattern Loss Threshold Criteria

**PATT LOS THR ?**

Print current DS3 pattern loss threshold criteria.

**PATT LOS THR FAS**

Set pattern loss threshold to FAST. Pattern loss occurs when 1024 or more bit errors are counted in 32,767 bits received.

**PATT LOS THR SLO**

Set pattern loss threshold to SLOW. Pattern loss occurs when 250,000 or more bit errors are counted in 1,000,000 bits received.

## PATTern — Set Data Pattern

**PATT ?**

Print current transmitted DS3 test pattern. The following patterns are divided into three groups: non-channelized patterns, channelized patterns, and DS1 insert patterns. The test pattern does not need to be set when the AUTO or THRU mode is selected.

**PATT <pattern>**

Select appropriate test pattern from the following list.

***Non-channelized Test Patterns*** — The following patterns only apply to the M13, UNFRAMED, and C-BIT modes.

**2^15-1** — Select 32,767-bit pseudorandom pattern.

**2^20-1** — Select 1,048,575-bit pseudorandom pattern.

**2^23-1** — Select 8,388,607-bit pseudorandom pattern.

**1010** — Select fixed framed or unframed alternating marks (1) and spaces (0) pattern.

**1100** — Select fixed framed or unframed repeating two marks (1) and two spaces (0) pattern.

**1111** — Select fixed framed or unframed all marks (1) pattern.

**USER1** — Select fixed 3- to 24-bit user-programmable test pattern. Use the **USER1** command to set the test pattern.

***Channelized Test Patterns*** — The following patterns only apply to the MUXED M13 and MUXED C-BIT modes.

**T1D4 1:7** — Select T1 D4 formatted 1:7 pattern

**T1D4 3/24** — Select T1 D4 formatted 3 IN 24 pattern.

**T1D4 1004** — Select T1 D4 formatted 1004 Hz tone.

**T1D4 LPD** — Select T1 D4 formatted loop-down code pattern.

**T1D4 LPU** — Select T1 D4 formatted loop-up code pattern.

**T1D4 QRS** — Select T1 D4 formatted QRSS pattern.

**T1E 1:7** — Select T1 ESF formatted 1:7 pattern.

**T1E 3/24** — Select T1 ESF formatted 3 IN 24 pattern.

**T1E 1004** — Select T1 ESF formatted 1004 Hz tone.

**T1E LPD** — Select T1 ESF formatted loop-down code pattern.

**T1E LPU** — Select T1 ESF formatted loop-up code pattern.

**T1E QRS** — Select T1 ESF formatted QRSS pattern.

***DS1 Insert Source*** — The following selections only apply to the DS1 INSERT mode. This command requires the 310-3 option.

**EXT DS1** — Select side-panel DS1 RECEIVE jack signal as the DS1 signal source to be inserted into the secondary DS3 signal.

**INT DS1** — Select 310-1 as the DS1 signal source to be inserted into the secondary DS3 signal.

***DS3 ATM Framing Mode*** — The following selections only apply to the M13 and C-BIT modes. This command requires the 310-17A option.

**ATM HEC** — Select ATM Header Error Correction (HEC) framing format.

**ATM PLCP** — Select ATM Physical Layer Convergence Protocol (PLCP) framing format.

**NOTE**

If **PATTern** is queried, ATM OFF may appear if the **ATM RATe SELect** command is set to DS1, OC-3c, or OC-12C instead of DS3.

See also: **MODe**

## PGM LPDn — Set Programmable Loop-Down Code

**PGM LPD ?**

Print current DS1 3- to 8-bit programmable loop-down code. The command only applies when operating in the MUXED M13 or MUXED C-BIT mode and the T1D4 LPDN or T1ESF LPDN pattern is selected. Set **DS1 LP CODe** command to **PGM** to select the loop code. The pattern is transmitted from left to right.

**PGM LPD [ 000 | 001 to 11111111 ]**

Set loop-down code in a binary format from 000 to 11111111.

See also: **DS1 LP CODe** and **PATTern**

## PGM LPUp — Set Programmable Loop-Up Code

**PGM LPU ?**

Print current DS1 3- to 8-bit programmable loop-up code. The command only applies when operating in the MUXED M13 or MUXED C-BIT mode and the T1D4 LPUP or T1ESF LPUP pattern is selected. Set **DS1 LP CODe** command to **PGM** to select the loop code. The pattern is transmitted from left to right.

**PGM LPU [ 000 | 001 to 11111111 ]**

Set loop-up code in a binary format from 000 to 11111111.

See also: **DS1 LP CODe** and **PATTern**

## PRInt BAUd RATe — Print RS-232 Interface Baud Rate

**PRI BAU RAT**

Prints the RS-232 interface baud rate. The baud rate can only be changed from the front panel (PRINT-BAUD RATE auxiliary function).

## PRInt BYTE — Print Specified TOH Byte

**PRInt <variable> BYTE**

Possible variables are: ?, A1, A2, C2, D1, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, F1, F2, G1, K1, K2, Z1, Z2, Z3, Z4, and Z5.

**NOTE**

The A1 or A2 byte, while in OC-12 transmit mode, cannot be set.

## PRInt CONtrols — Generate Controls Printout

**PRI CON**

This command prints the front-panel controls and auxiliary function configuration for the T-BERD 310. The **CONtrols** command performs the same function.

See also: **CONtrols**

## PRInt CUStom — Set Custom Results Printout

**PRI CUS ?**

Print current test results for the custom results printout. Select custom results printout with the **PRInt FORmat** command. The custom results printout is generated with the **PRInt RESults** or **RESUlts** command.

**PRI CUS <result name> ON**

Set **<result name>** to ON. A **<result name>** that is set to ON is printed in the custom results printout.

**PRI CUS <result name> OFF**

Set **<result name>** to OFF. A **<result name>** that is set to OFF is not printed in the custom results printout.

**PRI CUS ALL ON**

Set ALL the **<result names>** and Status and Alarm LEDs to ON. The custom results printout lists all the test results.

**PRI CUS ALL OFF**

Set ALL the **<result names>** and Status and Alarm LEDs to OFF. The custom results printout header is generated without the results.

**PRI CUS SEC <result name> ON**

Set secondary DS3 **<result name>** to ON. A **<result name>** that is set to ON is printed in the custom results printout.

**PRI CUS SEC <result name> OFF**

Set secondary DS3 **<result name>** to OFF. A **<result name>** that is set to OFF is not printed in the custom results printout.

Refer to the following list for Status and Alarm DS3, ATM (DS1, DS3, OC-3c, or OC-12c), and SONET LED **<result names>**. Refer to the **PRInt** command for a list of test **<result names>**.

***DS3 Status LEDs <result names>***

| | |
|---|---|
| C-BIT FRAME* | C-bit Frame Status LED |
| DS2 FRM SYNC* | DS2 Frame Sync Status LED |
| FRAME SYNC* | Frame Sync Status LED |
| IDLE PRES* | Idle Present Status LED |
| PATTERN SYNC | Pattern Sync Status LED |
| SIGNAL PRES* | Signal Present Status LED |

***DS3 Alarm LEDs <result names>***

| | |
|---|---|
| BLUE (AIS)* | Blue (AIS) Alarm LED |
| DS2 FRM LOSS* | DS2 Frame Loss Alarm LED |
| FAR-END ALRM* | Far-End Alarm LED |
| FRAME LOSS* | Frame Loss Alarm LED |
| PATTERN LOSS | Pattern Loss Alarm LED |
| POWER LOSS | Power Loss Alarm LED |
| SIGNAL LOSS* | Signal Loss Alarm LED |
| SONET LOSS | SONET Loss Alarm LED (SONET option required) |
| YELLOW* | Yellow Alarm LED |

***DS3 FEAC Codes <result names>***

| | |
|---|---|
| FEAC CODES* | FEAC Codes (prints detected codes) |

***SONET Status <result names> (SONET option required)***

| | |
|---|---|
| SONET FRAME | SONET Frame Sync |
| SONET P PTR | SONET Path Pointer |
| SONET SIGNAL | SONET Signal Present |
| SONET VT PTR | SONET VT Pointer |
| CONCAT | Concatenated Payload Detected |
| SON PAT SYNC | SONET Payload Pattern Synchronization |

***SONET Alarms <result names> (SONET option required)***

| | |
|---|---|
| SONET L AIS | SONET Line Alarm Indication Signal |
| SONET L RDI | SONET Line Remote Defect Indication |
| SONET LOF | SONET Loss Of Frame |
| SONET LOS | SONET Signal Loss |
| SONET P AIS | SONET Path Alarm Indication Signal |
| SONET P LOP | SONET Path Loss Of Pointer |
| SONET P RDI | SONET Path Remote Defect Indication |
| SONET SEF | SONET Severely Errored Frame |
| SONET VT AIS | SONET VT Alarm Indication Signal |
| SONET VT LOP | SONET VT Loss Of Pointer |
| SONET VT RDI | SONET VT Remote Defect Indication |
| SON LINE BIP | SONET Line BIP Alarm |
| SON PAT LOSS | SONET Payload Pattern Loss Alarm |
| SON PATH BIP | SONET Path BIP Alarm |
| SON SECT BIP | SONET Section BIP Alarm |
| SON VT BIP | SONET Virtual Tributary BIP Alarm |

***OC-3c, DS1, DS3, or OC-12c ATM Status LEDs <result names> (310-15, 310-17A, or 310-20 Option)***

| | |
|---|---|
| CELL SYNC | ATM Cell Synchronization Status |

***OC-3c, DS1, DS3, or OC-12c Alarm LEDs <result names> (310-15, 310-17A, or 310-20 Option)***

| | |
|---|---|
| ATM AIS | ATM OAM Alarm Indication Signal |
| ATM ALL IDLE | ATM All Idle Cells Receive Alarm |
| ATM LCD | ATM Loss of Cell Delineation Alarm (formally ATM SYN LOSS) |
| ATM LCD FAIL | ATM Loss of Cell Delineation Failure Alarm (formally ATM SYN FAIL) |
| ATM NO MASKD | ATM No Test Mask Cells Received Alarm |
| ATM OCD | ATM Out of Cell Delineation Alarm (formally ATM OOS) |
| ATM PLCP RDI | ATM Physical Layer Convergence Protocol Remote Defect Indication Alarm (310-17A Option) |
| ATM RDI | ATM OAM Remote Defect Indication Alarm |

*Valid DS3 Secondary <result names>.

See also: **PRInt FORmat**, **PRInt RESults**, and **RESUlts**

## PRInt EVEnt — Set Print Event Function

**PRI EVE ?**
Print current print event setting.

**PRI EVE OFF**
Set print event to OFF. Press <CTRL> <C> to clear the print buffer.

**PRI EVE 15 MIN**
Set print event for 15 minutes.

**PRI EVE 30 MIN**
Set print event for 30 minutes.

**PRI EVE ERR SEC**
Set print event for errored seconds.

**PRI EVE TES END**
Set print event for test end. The **TESt** command must be set to **TIMed**.

**PRI EVE TIM**
Set print event function for timed. Set print interval with **PRInt INTerval** command.

See also: **TESt** and **PRInt INTerval**

## PRInt FORmat — Set Test Results Printout Format

**PRI FOR ?**
Print current test results printout format for the T-BERD 310 and 310-1. Generate the selected results printout with the **PRInt RESults** or **RESUlts** command.

**PRI FOR CUS**
Set test results printout format to CUSTOM. Select custom results with the **PRInt CUStom** command.

**PRI FOR NOR**

Set test results printout format to NORMAL. The normal results printout lists the state of all Status and Alarm LEDs and test results.

**PRI FOR SUM**

Set test results printout format to SUMMARY. The summary results printout lists the state of all Status and Alarm LEDs and the test results that appear in the SUMMARY category.

See also: **PRInt CUStom, PRInt RESults,** and **RESUlts**

## PRInt GRAph — Print Pulse Shape Graph

**PRI GRA**

This command generates a pulse shape graph. A graphics compatible printer must be used to generate the pulse shape graph. Otherwise, this command will cause generated responses to be unreadable. Refer to the *T-BERD 310 User's Manual* for information on generating a pulse shape graph.

See also: **PULse MASk**

## PRInt INTerval — Set Timed Print Event Interval

**PRI INT ?**

Print current timed print interval between printouts when the **PRInt EVEnt** command is set to **TIMed**.

**PRI INT <hh:mm>**

Set print interval from 00:01 to 24:59.

See also: **PRInt EVEnt**

## PRInt MODe — Set Printout Mode

**PRI MOD ?**

Print current print mode. The command selects how the test results are accumulated when the **PRInt EVEnt** command is set to **TIMed**, **ERRored SECond**, **15 MINutes**, or **30 MINutes**.

**PRI MOD CON**

Set print mode to CONTINUOUS. Test results are accumulated for the duration of the test.

**PRI MOD DEL**

Set print mode to DELTA. Test results are accumulated from a test restart or the previous delta printout. As the printout is sent to the print buffer, all test result counters are reset to zero.

See also: **PRInt EVEnt** and **RESUlts**

## PRInt PARity — Print RS-232 Interface Parity

**PRI PAR**

Prints the RS-232 interface parity. The parity can only be changed from the front panel (PRINT-PARITY auxiliary function).

## PRInt RESults — Generate Test Results Printout

**PRI RES**
This command generates a T-BERD 310 test results printout.

See also: **RESUlts**

## PRInt TERminator — Set Line Terminator

**PRI TER ?**
Print current line terminator.

**PRI TER CR**
Set line terminator to a carriage return.

**PRI TER LF**
Set line terminator to a linefeed.

**PRI TER CRL**
Set line terminator to a carriage return and linefeed.

## PRInt TOH BYTES — Print All Received Overhead Bytes

**PRI TOH BYTES**
Print all received overhead bytes in table format.

## PRInt WIDth — Set Printout and Display Line Width

**PRI WID ?**
Print current line width of printouts. The command does not affect commands that do not generate printouts, e.g., help pages.

**PRI WID 40**
Set print line width to 40 characters per line.

**PRI WID 80**
Set print line width to 80 characters per line.

## PRInt — Print Selected Test Result

**PRI <result name>**
Print current primary T-BERD 310 test result value.

**PRI SEC <result name>**
Print current secondary T-BERD 310 test result value. This command requires the 310-3 option.

**NOTE**

The **<result name>** must be keyed in as indicated.

***Primary DS3 Result Names***

LOGIC Category

| | |
|---|---|
| AV BIT ERT | Average Bit Error Rate |
| BIT %EFS | Bit, Percentage of Error-Free Seconds |
| BIT ERR RT | Bit Error Rate |
| BIT ERR SEC | Bit Errored Seconds |
| BIT ERRORS | Bit Errors |
| BIT THR ES | Bit, Threshold Errored Seconds |
| SLIPS | Pattern Slips |
| SYNC ES | Synchronous Errored Seconds |
| SYNC L SEC | Synchronization Loss Seconds |

LOGIC Category, 310-10 Option

| | |
|---|---|
| % AVAIL SEC | % Available Seconds |
| % DEG MIN | % Degraded Minutes |
| % SEVERR SEC | % Severely Errored Seconds |
| AVAIL SEC | Available Seconds |
| CSES | Consecutive Severely Errored Seconds |
| DEG MIN | Degraded Minutes |
| SEV ERR SEC | Severely Errored Seconds |
| UNAVAIL SEC | Unavailable Seconds |

BPV Category

| | |
|---|---|
| AV BPV ERT | Average BPV Error Rate |
| BPV %EFS | BPV, Percentage of Error-Free Seconds |
| BPV ERR RT | BPV Error Rate |
| BPV ERR SEC | BPV Errored Seconds |
| BPV THR ES | BPV Threshold Errored Seconds |
| VIOLATIONS | Bipolar Violations |

PARITY Category

| | |
|---|---|
| AV C-BIT ERT | Average C-Bit Error Rate |
| AV FEBE RT | Average Far-End Block Error Rate |
| AV PAR ERT | Average Parity (P-Bit) Error Rate |
| C-BIT %EFS | C-Bit, Percentage of Error-Free Seconds |
| C-BIT ERR RT | C-Bit Error Rate |
| C-BIT ERRORS | C-Bit Errors |
| C-BIT TYPE A | C-Bit Errored Seconds, Type A |
| C-BIT TYPE B | C-Bit Errored Seconds, Type B |
| C-BIT TYPE C | C-Bit Errored Seconds, Type C |
| FEBE %EFS | Far-End Block Error, Percentage of Error-Free Seconds |
| FEBE | Far-end Block Errors |
| FEBE RT | Far-end Block Error Rate |
| FEBE TYPE A | Far-End Block Error, Errored Seconds, Type A |
| FEBE TYPE B | Far-End Block Error, Errored Seconds, Type B |
| FEBE TYPE C | Far-End Block Error, Errored Seconds, Type C |
| PAR %EFS | Parity (P-Bit), Percentage of Error-Free Seconds |
| PAR ERR RT | Parity (P-Bit) Error Rate |
| PAR ERR SEC | Parity (P-Bit) Errored Seconds |
| PAR ERRORS | Parity (P-Bit) Errors |

FRAME Category

| | |
|---|---|
| AV FRM ERT | Average Frame Error Rate |
| DS2 AV F ERT | DS2 Average Frame Error Rate |
| DS2 FRM ERR | DS2 Frame Errors |
| DS2 FRM ERT | DS2 Frame Error Rate |
| FEOOF SEC | Far-End Out-of-Frame Seconds |
| FRM %EFS | Frame, Percentage of Error-Free Seconds |
| FRM ERR RT | Frame Error Rate |
| FRM ERR SEC | Frame Errored Seconds |
| FRM ERRORS | Frame Errors |
| FRM LOSS CNT | DS3 Frame Loss Count |
| FRM THR ES | Frame Threshold Errored Seconds |
| NEOOF SEC | Near-End Out-of-Frame Seconds |
| RX X-BIT | Received X-Bit |
| TX X-BIT | Transmitted X-Bit |

SIGNAL Category

| | |
|---|---|
| FALL TIME | DS3 Pulse Fall Time |
| LEVEL | Received Signal Level, Vp |
| POWER | Received Signal Power Measurement |
| PULSE SHAPE | DS3 Pulse Shape Status |
| PULSE WIDTH | DS3 Pulse Width |
| RISE TIME | DS3 Pulse Rise Time |
| RX FREQ | Received Frequency |
| SIG L SEC | Signal Loss Seconds |
| TX FREQ | Transmitted Frequency |
| dBdsx LEVEL | Receive Signal Level in dBdsx |

SIGNAL Category, 310-5 Option

| | |
|---|---|
| HB JITTER | Highband Jitter |
| MAX HB JIT | Maximum Highband Jitter |
| MAX WB JIT | Maximum Wideband Jitter |
| WB JITTER | Wideband Jitter |

SIGNAL Category, 310-16 Option

| | |
|---|---|
| OPTICAL PWR | Optical Power |
| RETURN LOSS | Optical Return Loss |

TIME Category

| | |
|---|---|
| DATE | Current Date |
| ELAPSED TIME | Elapsed Time |
| TEST LENGTH | Timed Test Length |
| TIME | Current Time of Day |
| TIME LEFT | Timed Test Time Left |

SONET Category, 310-12, 310-13R, and 310-14R Options

| | |
|---|---|
| APS CONFIG | APS Configuration (Line Category) |
| APS INFO | APS Information (Line Category) |
| APS MSG CNT | APS Message Count (Line Category) |
| FRM WORD ERR | Frame Word Errors (Section Category) |
| LINE AIS SEC | Line AIS Seconds (Line Category) |
| LINE BIP ERR | Line BIP Errors (Line Category) |
| LINE BIP ES | Line BIP Errored Seconds (Line Category) |

| | |
|---|---|
| LINE BIP ESA | Line BIP Errored Seconds, Type A (Line Category) |
| LINE BIP ESB | Line BIP Errored Seconds, Type B (Line Category) |
| LINE BIP SES | Line BIP Severely Errored Seconds (Line Category) |
| LINE EQU BER | Line Equivalent Bit Error Rate (Line Category) |
| LINE FEBE | Line FEBE (Line Category) |
| LINE FEBE RT | Line FEBE Rate (Line Category) |
| LINE UAS | Line Unavailable Seconds (Line Category) |
| PATH AIS SEC | Path AIS/LOP Seconds (Path Category) |
| PATH BIP ERR | Path BIP Errors (Path Category) |
| PATH BIP ES | Path BIP Errored Seconds (Path Category) |
| PATH BIP ESA | Path BIP Errored Seconds, Type A (Path Category) |
| PATH BIP ESB | Path BIP Errored Seconds, Type B (Path Category) |
| PATH BIP SES | Path BIP Severely Errored Seconds (Path Category) |
| PATH EQU BER | Path Equivalent Bit Error Rate (Path Category) |
| PATH FEBE | Path FEBE (Path Category) |
| PATH FEBE RT | Path FEBE Rate (Path Category) |
| PATH TRACE | Path Trace Message (Path Category) |
| PATH UAS | Path Unavailable Seconds (Path Category) |
| POINTER DATA | Pointer Data (Line Category) |
| POINTER DEC | Pointer Decrements (Line Category) |
| POINTER INC | Pointer Increments (Line Category) |
| POINTER JUST | Pointer Justifications (Line Category) |
| POINTER NDF | Pointer New Data Flags (Line Category) |
| POINTER SIZE | Pointer Size Bits (Line Category) |
| SECT BIP ERR | Section BIP Errors (Section Category) |
| SECT BIP ES | Section BIP Errored Seconds (Section Category) |
| SECT BIP ESA | Section BIP Errored Seconds, Type A (Section Category) |
| SECT BIP ESB | Section BIP Errored Seconds, Type B (Section Category) |
| SECT BIP SES | Section BIP Severely Errored Seconds (Section Category) |
| SECT EQU BER | Section Equivalent Bit Error Rate (Section Category) |
| SIGNAL LABEL | Signal Label (Path Category) |
| SON LOS SEC | SONET Loss of Signal Seconds (Section Category) |
| SON RX FREQ | SONET Receive Frequency (Section Category) |
| SON SEF SEC | SONET Severely Errored Frame Seconds (Section Category) |
| SON TX FREQ | SONET Transmit Frequency (Section Category) |
| SYNC MSG | Z1 Byte Synchronization Message (Line Category) |
| SON BIT ERR | SONET Bit Errors (Path Category) |
| SON BIT ERT | SONET Bit Error Rate (Path Category) |
| SONET STATUS | SONET Payload Status Message (Path Category) |
| VT AIS SEC | VT AIS/LOP Seconds (VT Category) |
| VT BIP ERR | VT BIP Errors (VT Category) |
| VT BIP ES | VT BIP Errored Seconds (VT Category) |
| VT BIP ESA | VT BIP Errored Seconds, Type A (VT Category) |
| VT BIP ESB | VT BIP Errored Seconds, Type B (VT Category) |
| VT BIP SES | VT BIP Severely Errored Seconds (VT Category) |
| VT EQU BER | VT Equivalent Bit Error Rate (VT Category) |
| VT FEBE | VT FEBE (VT Category) |
| VT PTR DATA | VT Pointer Data (VT Category) |
| VT PTR DEC | VT Pointer Decrements (VT Category) |
| VT PTR INC | VT Pointer Increments (VT Category) |
| VT PTR JUST | VT Pointer Justifications (VT Category) |
| VT PTR NDF | VT Pointer New Data Flags (VT Category) |
| VT UAS | VT Unavailable Seconds (VT Category) |

ATM Category: 310-15, 310-17A, and 310-20 Options

| | |
|---|---|
| % CLP=1 | Percent of Cells with CLP Equals One |
| % DROP'D | Percent of Dropped Received Mask Cells (TTC) |
| % OUT OF SEQ | Percent of Out Of Sequence Cells (TTC) |
| %MISINSERTED | Percent of Misinserted Cells (TTC) |
| AIS SECONDS | AIS Alarm Seconds |
| ATM STATUS | ATM Status Results, Summary Category |
| AVG DLAY VAR | Average Cell Delay Variation |
| BKGRD BW | Background Bandwidth |
| BKGRD RT | Background Rate |
| BURST BW | Burst Bandwidth |
| BURST RATE | Burst Rate |
| CLP=1 | Cells with CLP Equals One |
| CORR TAG | Correlation Tag (TTC) |
| CORRECT ERRS | Correctable HEC Errors |
| CORRECT RATE | Correctable HEC Error Rate |
| CSF SECONDS | Cell Synchronization Failure Seconds |
| DROP'D CELLS | Dropped Received Mask Cells (TTC) |
| HEC ERR RATE | Header Error Control Error Rate |
| HEC ERRORS | Header Error Control Errors |
| IDLE BW | Idle Bandwidth |
| IDLE RT | Idle Cell Rate |
| IN-USE BW | In-Use Bandwidth |
| IN-USE RT | In-Use Rate |
| LOOP END-END | Loopback End-to-End |
| LOOP SEGMENT | Loopback Segment |
| MASK CELL BW | Mask Cell Bandwidth |
| MASK CELL RT | Mask Cell Rate |
| MASK CELLS | Mask Cells |
| MASK CONGEST | Received Mask Cells Marked Congested |
| MAX DLAY VAR | Maximum Cell Delay Variation |
| MAX BW | Maximum Bandwidth |
| MAX RATE | Maximum Rate |
| MIN DLAY VAR | Minimum Cell Delay Variation |
| MIN BW | Minimum Bandwidth |
| MIN RATE | Minimum Rate |
| MISINSERTED | Misinserted Cells (TTC) |
| NON-COR ERRS | Non-Correctable HEC Errors |
| NON-COR RATE | Non-Correctable HEC Error Rate |
| OUT OF SEQ | Out Of Sequence Cells (TTC) |
| RDI SECONDS | RDI Alarm Seconds |
| TOTL CONGEST | Total received ATM Cells Marked Congested |

ATM Category, 310-17A Option only

| | |
|---|---|
| AVG RT DELAY | Average Round Trip Delay |
| ERR'D CELLS | Errored Cell Count |
| ERR'D RATE | Errored Cell Rate |
| MAX RT DELAY | Maximum Round Trip Delay |
| PLCP BIP ERR | PLCP Bit Interleaved Parity Error Count |
| PLCP BIP RT | PLCP Bit Interleaved Parity Error Rate |
| PLCP FEBE | PLCP Far-End Block Errors |
| PLCP FRM ERR | PLCP Frame Word Error Count |

***Secondary DS3 Result Names (requires 310-3 option)***

BPV Category

| | |
|---|---|
| AV BPV ERT | Average BPV Error Rate |
| BPV %EFS | BPV, Percentage of Error-Free Seconds |
| BPV ERR RT | BPV Error Rate |
| BPV ERR SEC | BPV Errored Seconds |
| VIOLATIONS | Bipolar Violations |

PARITY Category

| | |
|---|---|
| AV C-BIT ERT | Average C-bit Parity Error Rate |
| AV FEBE RT | Average Far-End Block Error Rate |
| AV PAR ERT | Average Parity (P-bit) Error Rate |
| C-BIT %EFS | C-bit Parity, Percentage of Error-Free Seconds |
| C-BIT ERR RT | C-bit Parity Error Rate |
| C-BIT ERRORS | C-bit Parity Errors |
| C-BIT TYPE A | C-bit Parity Errored Seconds, Type A |
| C-BIT TYPE B | C-bit Parity Errored Seconds, Type B |
| C-BIT TYPE C | C-bit Parity Errored Seconds, Type C |
| FEBE %EFS | Far-End Block Error, Percentage of Error-Free Seconds |
| FEBE | Far-End Block Errors |
| FEBE RT | Far-End Block Error Rate |
| FEBE TYPE A | Far-End Block Errored Seconds, Type A |
| FEBE TYPE B | Far-End Block Errored Seconds, Type B |
| FEBE TYPE C | Far-End Errored Seconds, Type C |
| PAR %EFS | Parity (P-bit), Percentage of Error-Free Seconds |
| PAR ERR RT | Parity (P-bit) Error Rate |
| PAR ERR SEC | Parity (P-bit) Errored Seconds |
| PAR ERRORS | Parity (P-bit) Errors |

FRAME Category

| | |
|---|---|
| AV FRM ERT | Average Frame Error Rate |
| FRM %EFS | Frame, Percentage of Error-Free Seconds |
| FRM ERR RT | Frame Error Rate |
| FRM ERR SEC | Frame Errored Seconds |
| FRM ERRORS | Frame Errors |

SIGNAL Category

| | |
|---|---|
| RX FREQ | Received Frequency in Hertz |

## PROmpt — Set Terminal Mode Prompt

**PRO ?**

Print current terminal mode prompt. A "**>**" (greater than sign) indicates the T-BERD 310 is ready to accept a command. The "**>**" is the prompt default. A "**+**" (plus sign) indicates when the T-BERD 310 is ready to accept a command and the **HOLd** command has been executed. A user-defined prompt can also be created.

**PRO ON**

Turn the prompt ON.

**PRO OFF**

Turn the prompt OFF.

**PRO STR <prompt string>**

Create a user-defined prompt. The **<prompt string>** can be 32 characters in length. The **<prompt string>** is stored in NOVRAM. The prompt can be removed by creating a new prompt or executing the **FIRST POWERUP** command.

See also: **HOLd** and **RELease**

## PULse MASk — Set Pulse Shape Mask Specification

**PUL MAS ?**

Print current DS3 pulse shape mask setting. The selected mask is generated along with the normalized pulse shape in the pulse shape graph printout. The SIGNAL category PULSE SHAPE result is affected by the selected pulse mask.

**PUL MAS NON**

Set pulse mask to NONE. The pulse shape continues to be analyzed but is not compared to a pulse mask.

**PUL MAS ANS**

Set pulse mask to the ANSI T1.102-1991 pulse mask specification.

**PUL MAS 93A**

Set pulse mask to the ANSI T1.102-1993 pulse mask specification.

**PUL MAS CCI**

Set pulse mask to the proposed ITU-T G.703 pulse mask recommendation.

See also: **PRInt GRAph**

## RAW LEDs — Raw DS3 Signal LED Status

**RAW LED**

Print current status of the DS3 signal status and alarm LEDs in a seven byte hexadecimal format. Each byte represents the on (1) or off (0) status of the individual DS3 status and alarm LEDs as indicated in Table 2-1. Each byte (XX) relates to a specific group of LEDs. The table describes the seven bytes, starting with the first byte, and the individual LED bit positions within each byte. The "XX" and "X" represent the specific hexadecimal byte and bit position for the specified LED. The following example identifies Byte 6 as having a hex value of 23 with a bit sequence of 0010 0011. This command is a hexadecimal equivalent to the **LEDs** command.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | Byte Number | |
|---|---|---|---|---|---|---|---|---|
| 00 | 00 | 00 | 00 | 00 | 23 | 00 | Displayed Hex Bytes | |
| 0010 0011 | | | | | | | Bit Pattern for Byte 6 | |
| | | | | | | 1 | Signal Present | ON |
| | | | | | 1 | | Frame Sync | ON |
| | | | | 0 | | | C-bit Frame | OFF |
| | | | 0 | | | | Idle Present | OFF |
| | | 0 | | | | | DS2 Frame Sync | OFF |
| | 1 | | | | | | Pattern Sync | ON |
| 0 | | | | | | | SONET Present | OFF |

**Table 2-1. DS3 Status and Alarm RAW LEDs Command**

| XX 00 00 00 00 00 00 | Byte 1 - Primary Alarm History | |
|---|---|---|
| 0000 000X | Bit 0 | Signal Loss History |
| 0000 00X0 | Bit 1 | Frame Loss History |
| 0000 0X00 | Bit 2 | DS2 Frame Loss History |
| 0000 X000 | Bit 3 | Blue Alarm History |
| 000X 0000 | Bit 4 | Yellow Alarm History |
| 00X0 0000 | Bit 5 | Far-End Alarm History |
| 0X00 0000 | Bit 6 | Pattern Loss History |
| X000 0000 | Bit 7 | SONET Loss History |
| **00 XX 00 00 00 00 00** | **Byte 2 - Power Loss History** | |
| 0000 000X | Bit 0 | Power Loss History |
| **00 00 XX 00 00 00 00** | **Byte 3 - Primary Alarms** | |
| 0000 000X | Bit 0 | Signal Loss |
| 0000 00X0 | Bit 1 | Frame Loss |
| 0000 0X00 | Bit 2 | DS2 Frame Loss |
| 0000 X000 | Bit 3 | Blue Alarm |
| 000X 0000 | Bit 4 | Yellow Alarm |
| 00X0 0000 | Bit 5 | Far-End Alarm |
| 0X00 0000 | Bit 6 | Pattern Loss |
| X000 0000 | Bit 7 | SONET Loss |
| **00 00 00 XX 00 00 00** | **Byte 4 - Secondary Alarms** | |
| 0000 000X | Bit 0 | Signal Loss |
| 0000 00X0 | Bit 1 | Frame Loss |
| 0000 0X00 | Bit 2 | DS2 Frame Loss |
| 0000 X000 | Bit 3 | Blue Alarm |
| 000X 0000 | Bit 4 | Yellow Alarm |
| 00X0 0000 | Bit 5 | Far-End Alarm |

| 00 00 00 00 XX 00 00 | Byte 5 - Secondary Alarm History | |
|---|---|---|
| 0000 000X | Bit 0 | Signal Loss History |
| 0000 00X0 | Bit 1 | Frame Loss History |
| 0000 0X00 | Bit 2 | DS2 Frame Loss History |
| 0000 X000 | Bit 3 | Blue Alarm History |
| 000X 0000 | Bit 4 | Yellow Alarm History |
| 00X0 0000 | Bit 5 | Far-End Alarm History |
| **00 00 00 00 00 XX 00** | **Byte 6 - Primary Status** | |
| 0000 000X | Bit 0 | Signal Present |
| 0000 00X0 | Bit 1 | Frame Sync |
| 0000 0X00 | Bit 2 | C-bit Frame |
| 0000 X000 | Bit 3 | Idle Present |
| 000X 0000 | Bit 4 | DS2 Frame Sync |
| 00X0 0000 | Bit 5 | Pattern Sync |
| 0X00 0000 | Bit 6 | SONET Present |
| **00 00 00 00 00 00 XX** | **Byte 7 - Secondary Status** | |
| 0000 000X | Bit 0 | Signal Present |
| 0000 00X0 | Bit 1 | Frame Sync |
| 0000 0X00 | Bit 2 | C-bit Frame |
| 0000 X000 | Bit 3 | Idle Present |
| 000X 0000 | Bit 4 | DS2 Frame Sync |

## RAW ATM LEDs — Raw ATM Signal LED Status

### RAW ATM LED

Print current status of the DS1, DS3, OC-3c, or OC-12c ATM signal status and alarm LEDs in a five byte hexadecimal format. Each byte represents the on (1) or off (0) status of the individual ATM status and alarm LEDs as indicated in Table 2-2. Each byte (XX) relates to a specific group of LEDs. The table describes the five bytes, starting with the first byte, and the individual LED bit positions within each byte. The "XX" and "X" represent the specific hexadecimal byte and bit position for the specified LED. The following example identifies Byte 5 as having a hex value of 01 with a bit sequence of 0000 0001. Requires the 310-15, 310-17A, or 310-20 option.

| 1 | 2 | 3 | 4 | 5 | | | **Byte Number** |
|---|---|---|---|---|---|---|---|
| 00 | 00 | 00 | 00 | 01 | | | **Displayed Hex Bytes** |
| 0000 0001 | | | | | | | **Bit Pattern for Byte 5** |
| | | | | | | 1 | **Cell Sync** **ON** |

**Table 2-2. ATM Status and Alarm RAW LEDs Command**

| XX 00 00 00 00 | Byte 1 - Alarm History 1 | |
|---|---|---|
| 0000 000X | Bit 0 | OCD History |
| 0000 00X0 | Bit 1 | AIS History |
| 0000 0X00 | Bit 2 | RDI History |
| 0000 X000 | Bit 3 | LCD History |
| 000X 0000 | Bit 4 | LCD Fail History |
| 00X0 0000 | Bit 5 | Combo (No Cell Sync) History |
| 0X00 0000 | Bit 6 | PLCP RDI History |
| X000 0000 | Bit 7 | All Idle History |
| 00 XX 00 00 00 | Byte 2 - Alarm History 2 | |
| 0000 000X | Bit 0 | No Masked Cells History |

| 00 00 XX 00 00 | Byte 3 - Alarms 1 | |
|---|---|---|
| 0000 000X | Bit 0 | OCD |
| 0000 00X0 | Bit 1 | AIS |
| 0000 0X00 | Bit 2 | RDI |
| 0000 X000 | Bit 3 | LCD |
| 000X 0000 | Bit 4 | LCD Fail |
| 00X0 0000 | Bit 5 | Combo (No Cell Sync) |
| 0X00 0000 | Bit 6 | PLCP RDI |
| X000 0000 | Bit 7 | All Idle |
| 00 00 00 XX 00 | Byte 4 - Alarms 2 | |
| 0000 000X | Bit 0 | No Masked Cells |
| 00 00 00 00 XX | Byte 5 - Status | |
| 0000 000X | Bit 0 | Cell Sync |

## RAW SONet LEDs

## Raw SONET Signal LED Status

### RAW SON LED

Print current status of the SONET signal status and alarm LEDs in a seven byte hexadecimal format. Each byte represents the on (1) or off (0) status of the individual SONET status and alarm LEDs as indicated in Table 2-3. Each byte (XX) relates to a specific group of LEDs. The table describes the seven bytes, starting with the first byte, and the individual LED bit positions within each byte. The "XX" and "X" represent the specific hexadecimal byte and bit position for the specified LED. The following example identifies Byte 5 as having a hex value of 23 with a bit sequence of 0010 0011.

This command is a hexadecimal equivalent to the **SONet LEDs** command. Requires a SONET option.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Byte Number | |
|---|---|---|---|---|---|---|---|---|---|
| | 00 | 00 | 00 | 00 | 23 | 00 | 00 | Displayed Hex Bytes | |
| 0010 0011 | | | | | | | | Bit Pattern for Byte 5 | |
| | | | | | | | 1 | VT AIS | ON |
| | | | | | | 1 | | VT RDI | ON |
| | | | | | 0 | | | VT LOP | OFF |
| | | | | 0 | | | | Section BIP | OFF |
| | | | 0 | | | | | Line BIP | OFF |
| | | 1 | | | | | | Path BIP | ON |
| | 0 | | | | | | | VT BIP | OFF |
| 0 | | | | | | | | Pattern Sync Loss | OFF |

**Table 2-3. SONET Status and Alarm RAW LEDs Command**

| XX 00 00 00 00 00 00 | Byte 1 - Alarms History 1 | |
|---|---|---|
| 0000 000X | Bit 0 | Loss of Signal History |
| 0000 00X0 | Bit 1 | OOF History |
| 0000 0X00 | Bit 2 | LOF History |
| 0000 X000 | Bit 3 | Line AIS History |
| 000X 0000 | Bit 4 | Line RDI History |
| 00X0 0000 | Bit 5 | Path AIS History |

| 00 00 00 XX 00 00 00 | Byte 4 - Alarms 1 | |
|---|---|---|
| 0000 000X | Bit 0 | Loss of Signal |
| 0000 00X0 | Bit 1 | OOF |
| 0000 0X00 | Bit 2 | LOF |
| 0000 X000 | Bit 3 | Line AIS |
| 000X 0000 | Bit 4 | Line RDI |
| 00X0 0000 | Bit 5 | Path AIS |

**Table 2-3. SONET Status and Alarm RAW LEDs Command (Continued)**

| | | | | | |
|---|---|---|---|---|---|
| 0X00 0000 | Bit 6 | Path RDI History | 0X00 0000 | Bit 6 | Path RDI |
| X000 0000 | Bit 7 | Path LOP History | X000 0000 | Bit 7 | Path LOP |
| **00 XX 00 00 00 00 00** | **Byte 2 - Alarms History 2** | | **00 00 00 00 XX 00 00** | **Byte 5 - Alarms 2** | |
| 0000 000X | Bit 0 | VT AIS History | 0000 000X | Bit 0 | VT AIS |
| 0000 00X0 | Bit 1 | VT RDI History | 0000 00X0 | Bit 1 | VT RDI |
| 0000 0X00 | Bit 2 | VT LOP History | 0000 0X00 | Bit 2 | VT LOP |
| 0000 X000 | Bit 3 | Section BIP History | 0000 X000 | Bit 3 | Section BIP |
| 000X 0000 | Bit 4 | Line BIP History | 000X 0000 | Bit 4 | Line BIP |
| 00X0 0000 | Bit 5 | Path BIP History | 00X0 0000 | Bit 5 | Path BIP |
| 0X00 0000 | Bit 6 | VT BIP History | 0X00 0000 | Bit 6 | VT BIP |
| X000 0000 | Bit 7 | Pattern Sync Loss History[1] | X000 0000 | Bit 7 | Pattern Sync Loss[1] |
| **00 00 XX 00 00 00 00** | **Byte 3 - Alarms History 3** | | **00 00 00 00 00 XX 00** | **Byte 6 - Alarms 3** | |
| 0000 000X | Bit 0 | Path PTR Adjust History | 0000 000X | Bit 0 | Path PTR Adjust |
| 0000 00X0 | Bit 1 | VT PTR Adjust History | 0000 00X0 | Bit 1 | VT PTR Adjust |
| | | | **00 00 00 00 00 00 XX** | **Byte 7 - Status** | |
| | | | 0000 000X | Bit 0 | Frame Sync |
| | | | 0000 00X0 | Bit 1 | Signal Present |
| | | | 0000 0X00 | Bit 2 | Path PTR Present |
| | | | 0000 X000 | Bit 3 | VT PTR Present |
| | | | 000X 0000 | Bit 4 | Concat Present |
| | | | 00X0 0000 | Bit 5 | Pattern Sync[1] |

1. Pattern Sync and Pattern Sync Loss only apply when the K-S or higher software revision is installed.

## RECeive INPut — Set Primary DS3 Receive Input Level

**REC INP ?**

Print current DS3 RECEIVE jack receive input level.

**REC INP HIG**

Set receive input to HIGH.

**REC INP DSX**

Set receive input to DSX.

**REC INP LOW**

Set receive input to LOW.

## RELease — Release All Printer Output

**REL**

This command disables the **HOLd** command and releases the print buffer output. The prompt changes from **+** to **>** when the buffer hold is released. Any printouts generated during the hold are printed.

See also: **HOLd** and **PROmpt**

## REMote — Enter Remote Control Mode

**REM ( , )**

This command places the T-BERD 310 in the remote control mode from the local or terminal mode. The command disables the following functions: **PROmpt**, **ECHo**, and front-panel switches (except **RESULTS** switches). The message "232 REMOTE CONTROL" flashes in the MODE/PATTERN window. The comma (,) can be used in place of **REMote**.

See also: **LOCal, TERminal, PROmpt,** and **ECHo**

EXAMPLE 1 (local to remote mode):

(The T-BERD 310 (and 310-1) is in local mode. Enter the **REM** command. The command is not echoed from the T-BERD 310.)

```
Remote Control activated, now in control
```

(The T-BERD 310 responds with the above message and is placed in remote control mode. The **PROmpt**, **ECHo**, and front-panel switches (except **RESULTS** switches) are disabled. *232 REMOTE CONTROL* flashes in the MODE/PATTERN window.)

Enter **PRI TIM** (This is not echoed.)

12:34:23 (The T-BERD 310 responds with the current time.)

EXAMPLE 2 (terminal to remote mode):

**> rem** (The T-BERD 310 (and 310-1) is in local mode. Enter the **REM** command. The command is echoed from the T-BERD 310.)

```
Terminal mode deactivated.
```

(The T-BERD 310 responds with the above message and is in remote control mode. The **PROmpt**, **ECHo**, and front-panel switches (except **RESULTS** switches) are disabled. *232 REMOTE CONTROL* flashes in the MODE/PATTERN window.)

Enter **PRI TIM** (This is not echoed.)

12:34:23 (The T-BERD 310 responds with the current time.)

## RES1 or RES2 — Test Results Display I/II Control

**RES1 or RES2 ?**

Print current test result displayed in the RESULTS I or RESULTS II window. Refer to the **PRInt** command for a list of valid **<result names>**.

**RES1 or RES2 <result name>**

Display the primary DS3 **<result name>** in the RESULTS I or RESULTS II window.

**RES1 or RES2 SECondary <result name>**

Display the secondary DS3 **<result name>** in the RESULTS I or RESULTS II window. This command requires the 310-3 option.

See also: **PRInt**

## RESTART — Initiate Test Restart

**RESTART**

This command restarts the T-BERD 310 mainframe test. All SONET, DS1, and DS3 ATM test results are set to zero. All 310-1 test results continue to accumulate until the **@RESTART** command is executed. If **ATM RATe SELect** is set to DS1, then the RESTART command will also restart the 310-1 Lid Option.

See also: **@RESTART**

## RESUlts — Generate Test Results Printout

**RESU**

This command generates a T-BERD 310 test results printout.

See also: **PRInt RESUlts** and **PRInt EVEnt**

## SET DATe — Set Calendar Date

**SET DAT ?**

Print current calendar date.

**SET DAT <mmm dd>**

Set calendar date with the correct month and day. Enter the month (mmm) from JANuary to DECember. Enter the date (dd) from 1 to 31.

## SET TIMe — Set Time of Day

**SET TIM ?**

Print current time of day.

**SET TIM <hh:mm>**

Set time of day in hours and minutes using the 24 hour clock format.

## SONet ALArm — SONET Alarm Insertion Select

**SON ALA ?**

Print current SONET alarms being transmitted over the SONET signal. This command requires the 310-13T or 310-14T option. Use the **SONet LEDs** command to report on the status of the received alarms.

**SON ALA LIN AIS**

Insert a Line alarm indication signal alarm.

**SON ALA LIN RDI**

Insert a Line remote defect indication alarm.

**SON ALA OFF**

Disable the transmitted alarm.

**SON ALA PAT AIS**
Insert a Path alarm indication signal alarm.

**SON ALA PAT LOP**
Insert a Path loss of pointer alarm.

**SON ALA PAT RDI**
Insert a Path remote defect indication alarm.

**SON ALA VT AIS**
Insert a VT alarm indication signal alarm.

**SON ALA VT LOP**
Insert a VT loss of pointer alarm.

**SON ALA VT RDI**
Insert a VT remote defect indication alarm.

See also: **SONet LEDs**

## SONet DCC — SONET Data Communication Channel Drop and Insert Control

**SON DCC ?**
Print current drop and insert capabilities for the data communication channel (DCC). The DCC is accessed through the DCC DROP/INSERT connector on the 310-13R or 310-14R option. This command requires the 310-13R/T pair or 310-14R/T pair option for full DCC drop and insert capabilities.

**SON DCC NON**
Disable the insert function of the selected DCC. An all zeros signal is placed in the transmitted Line and Section DCC.

**SON DCC LIN**
Select Line DCC to be dropped and inserted.

**SON DCC SEC**
Select Section DCC to be dropped and inserted.

## SONet DROp — SONET Dropped Payload Format

**SON DRO ?**
Print current SONET dropped payload signal format selection. If lowercase characters appear, the **SONet DROp AUTo** command has been executed. For the DS1 payload formats, use the **SONet DS1 CHAnnel RX** command to select the dropped channel. This command requires the 310-13R or 310-14R option.

**SON DRO <payload >**
Select SONET payload signal format and connection to be dropped from the following list:

**ATM3c** — Drop an ATM tributary from the selected STS ID of an OC-3, OC-12, or OC-48 signal. The command is only valid when the SONet INPut command is set to OC-3. This command requires the 310-15 option.

**ATM12c** — Drop an ATM tributary from the selected STS ID of an OC-12 or OC-48 signal. The command is only valid when the **SONet INPut** command is set to OC-12. This command requires the 310-20 option.

**CON3c** — Drop an OC-3c tributary from the selected OC-3, OC-12, or OC-48 signal. The command is only valid when the **SONet INPut** command is set to OC-3. This command requires the 310-14R, -14T options.

**CON12c** — Drop an OC-12c tributary from the selected OC-12 and OC-48 signal. The command is only valid when the **SONet INPut** command is set to OC-12. This command requires the 310-12 option.

**CON48c** — Drop an OC-48c tributary from the selected OC-48 signal. The command is only valid when the **SONet INPut** command is set to OC-48. This command requires the 310-21 option.

**AUT** — Enable the automatic payload detection function.

**DS1 ASY** — Drop a DS1 asynchronous payload from the selected STS ID.

**DS1 BIT** — Drop a DS1 bit-synchronous payload from the selected STS ID.

**DS1 BYT** — Drop a DS1 byte-synchronous payload from the selected STS ID.

**DS3 ASYn** — Drop a DS3 asynchronous payload from the selected STS ID.

**2^23-1 (3c)** — Drop an OC-3c 2^23-1 test pattern from the selected STS ID.

**i2^23-1 (3c)** — Drop an inverted OC-3c 2^23-1 test pattern from the selected STS ID.

**2^23-1 (12c)** — Drop an OC-12c 2^23-1 test pattern from the selected STS ID.

**i2^23-1 (12c)** — Drop an inverted OC-12c 2^23-1 test pattern from the selected STS ID.

**2^23-1 (48c)** — Drop an OC-48c 2^23-1 test pattern from the selected STS IDp.

**i2^23-1 (48c)** — Drop an inverted OC-48c 2^23-1 test pattern from the selected STS ID.

**2^31-1 (48c)** — Drop an OC-48c 2^31-1 test pattern from the selected STS ID.

**i2^31-1 (48c)** — Drop an inverted OC-48c 2^31-1 test pattern from the selected STS ID.

See also: **SONet DS1 CHAnnel RX, SONet INSert, SONet INPut, SONet DS1 CHAnnel TX**, and **DS1 SIGnaling BITs**

## SONet DS1 CHAnnel RX — SONET DS1 Channel Select

**SON DS1 CHA RX ?**

Print current DS1 channel (in "group channel" format) from the SONET DS1 signal. Select the DS1 payload format with the **SONet DROp** command. Set channel type with the **DS1 VT MAP** command. This command requires the 310-13R or 310-14R option.

**SON DS1 CHA RX x,y**

Set SONET DS1 channel to the selected group and VT, **x** is the group and **y** is the channel. Refer to the *T-BERD 310 User's Manual* for valid **x** (group), **y** (channel) numbers.

See also: **SONet DROp** and **DS1 VT MAP**

## SONet DS1 CHAnnel TX — SONET Insert Signal Source, DS1 Channel

**SON DS1 CHA TX ?**

Print current SONET DS1 payload to be inserted. Use the **SONet INSert** command to select the SONET payload signal format: **DS1 ASYn**, **DS1 BIT**, or **DS1 BYTe**. The **SONet DS1 CHAnnel TX** is not valid when the **SONet INSert** command is set to **DS3 ASYn** or **UNEquipped**. Set channel type with the **DS1 VT MAP** command. This command requires the 310-13T or 310-14T option.

**SON DS1 CHA TX x,y**

Set SONET DS1 channel to the selected group and VT, **x** is the group and **y** is the channel. Refer to the *T-BERD 310 User's Manual* for valid **x** (group), **y** (channel) numbers.

**SON DS1 CHA TX ALL**

Insert the DS1 test signal into all VT1.5 channels.

See also: **SONet INSert** and **DS1 VT MAP**

## SONet ERRor INSert — SONET Error Insertion Select

**SON ERR INS ?**

Print current SONET BIP, FEBE, or frame word error being inserted. Only one **<error_type>** can be inserted at a time. Use the **SONet ERRor RATe** command to set the error insertion rate. Use the **SONet FRAme ERRor** command to set the number of consecutive frame word errors to insert. This command requires the 310-13T or 310-14T option.

**SON ERR INS OFF**

Disable selected BIP, FEBE, or frame word error insertion selection.

**SON ERR INS <error_type> <insertion_type>**

Insert indicated **<error_type>** and **<insertion_type>** from the following selections.

Select an **<error_type>**:

**FRA WOR** — Insert frame word errors at the indicated insertion rate.

**LIN BIP** — Insert Line BIP errors at the indicated insertion rate.

**LIN FEB** — Insert Line FEBEs at the indicated insertion rate.

**PAT BIP** — Insert Path BIP errors at the indicated insertion rate.

**PAT FEB** — Insert Path FEBEs at the indicated insertion rate.

**SEC BIP** — Insert Section BIP errors at the indicated insertion rate.

**VT BIP** — Insert VT BIP errors at the indicated insertion rate.

**VT FEB** — Insert VT FEBEs at the indicated insertion rate.

**LOG** — Insert logic errors at the indicated insertion rate into the 2^23-1 (3c) or I2^23-1 (3c) pattern. Only the SIN and RAT insertion types are allowed.

**NOTE**

VT errors can only be inserted when VT1.5 mapping is selected with the **SONet INSert** command.

Select an **<insertion_type>**:

**SIN** — Insert a single BIP or FEBE error with the indicated error type.

**RAT** — Insert continuous BIP or FEBE errors with the indicated error type at the error rate selected with the **SONet ERRor RATe** command.

**BUR** — Insert a single burst of consecutive frame word errors. Select number of consecutive frame word errors with the **SONet FRAme ERRor** command.

**CON** — Insert continuous consecutive frame word errors. Select number of consecutive frame word errors with the **SONet FRAme ERRor** command.

See also: **SONet ERRor RATe** and **SONet FRAme ERRor**

## SONet ERRor RATe — SONET Error Insertion Rate Select, BIP and FEBE Errors

**SON ERR RAT ?**

Print current SONET error insertion rate for inserting BIP errors and FEBEs in the transmitted SONET signal. This error rate applies to the **SONet ERRor INSert BIP** and **FEBe** commands. This command requires the 310-13T or 310-14T option.

**SON ERR RAT <insertion_rate>**

Select SONET error insertion rate as follows: 1E-4, 1E-5, 1E-6, 1E-7, 1E-8, and 1E-9.

See also: **SONet ERRor INSert**

## SONet FRAme ERRor — SONET Error Insertion Rate Select, Frame Word Errors

**SON FRA ERR ?**

Print current number of consecutive frame word errors being inserted. This error rate applies to the **SONet ERRor INSert FRAme WORd** command. This command requires the 310-13T or 310-14T option.

**SON FRA ERR [ 1 | 2 | 3 | 4 | 5 ]**

Select number of consecutive frame word errors to be inserted: 1, 2, 3, 4, or 5.

See also: **SONet ERRor INSert**

## SONet INPut — SONET Input Signal Source

**SON INP ?**

Print current SONET input receive rate and connection to be analyzed. This command requires the 310-12, 310-13R, 310-14R option, or 310-21option.

**SON INP STM-1**

Select the side-panel OC-1/3 RECEIVE connector on the 310-14R option to analyze the STM-1 signal.

**SON INP STS-1**

Select side-panel STS-1 RECEIVE connector on the 310-13R or 310-14R option to analyze an STS-1 signal. Use the **STS RX LEVel** command to set receive level.

**SON INP OC-1**

Select side-panel OC-1/3 RECEIVE connector on the 310-14R option to analyze an OC-1 signal.

**SON INP OC-3**

Select side-panel OC-1/3 RECEIVE connector on the 310-14R option to analyze an OC-3 signal or OC-3c or ATM tributary. Use the **SONet STS ID RX** command to select the STS-1 to be analyzed.

**SON INP OC-12**

Select side-panel OC-12 RECEIVE connector on the 310-12 option to analyze an OC-12 signal or OC-12c or ATM tributary. Use the **SONet STS ID RX** command to select the STS-1 to be analyzed.

**SON INP OC-48**

Select side-panel OC-48 RECEIVE connector on the 310-21 option to analyze an OC-48 signal or OC-48c or ATM tributary. Use the **SONet STS ID RX** command to select the STS-1 to be analyzed.

See also: **STS RX LEVel, SONet STS ID RX, SONet OUTput,** and **SONet STS ID TX**

## SONet INSert — SONET Insert Signal Source

**SON INS ?**

Print current SONET payload signal format and connection to be inserted. Use the **SONet DS1 CHAnnel TX** command to select the VT1.5 channel to insert the DS1 signal. The **SONet INSert** command is not applicable with the **SONet OUTput THRu** command. This command requires the 310-13T or 310-14T option. The DS1 commands require the 310-1 option.

**SON INS <payload>**

Select SONET payload signal format and connection to be inserted from the following list.

**NOTE**

When writing DTM scripts, drop parentheses from the following command (parentheses conflict with script syntax): SON INS ATM(3C).

**ATM3c** — Insert (or generate) an ATM signal. The command is only valid when **SONet OUTput** command is set to OC-3, OC-12, or OC-48. This command requires the 310-15 option.

**ATM12c** — Insert (or generate) an ATM signal. The command is only valid when **SONet OUTput** command is set to OC-12 or OC-48. This command requires the 310-20 option.

**CON3c** — Insert an OC-3c tributary into an OC-3, OC-12, or OC-48 signal.

**CON12c** — Insert an OC-12c tributary into an OC-12 or OC-48 signal.

**CON48c** — Insert an OC-48c tributary into an OC-48 signal.

**DS1 ASY EXT** — Insert an externally generated DS1 asynchronous signal from the 310-1 DS1 RECEIVE jack into the selected STS ID.

**DS1 ASY INT** — Insert a 310-1 internally generated DS1 asynchronous signal into the selected STS ID.

**DS1 BIT EXT** — Insert an externally generated DS1 bit-synchronous signal from the 310-1 DS1 RECEIVE jack into the selected STS ID.

**DS1 BIT INT** — Insert a 310-1 internally generated DS1 bit-synchronous signal into selected STS ID.

**DS1 BYT EXT** — Insert an externally generated DS1 byte-synchronous signal from the 310-1 DS1 RECEIVE jack into the selected STS ID.

**DS1 BYT INT** — Insert a 310-1 internally generated DS1 byte-synchronous signal into the selected STS ID.

**DS3 ASY EXT** — Insert an externally generated DS3 asynchronous signal from the DS3 RECEIVE jack into the selected STS ID.

**DS3 ASY INT** — Insert a 310-1 internally generated DS3 asynchronous signal into the selected STS ID.

**PAT UNE** — Insert a Path unequipped signal. The test signal is not inserted and the selected STS ID payload is marked unequipped.

**VT1.5 UNE** — Insert a VT1.5 unequipped signal. The test signal is not inserted and the each VT1.5 signal is marked unequipped.

**SON INS 2^23-1 3c** — Insert an OC-3c 2^23-1 test pattern into all STS ID groups.

**SON INS I2^23-1 3c** — Insert an inverted OC-3c 2^23-1 test pattern into all STS ID groups.

**SON INS 2^23-1 12c** — Insert an OC-12c 2^23-1 test pattern into all STS ID groups.

**SON INS I2^23-1 12c** — Insert an inverted OC-12c 2^23-1 test pattern into all STS ID groups.

**SON INS 2^23-1 48c** — Insert an OC-48c 2^23-1 test pattern into all STS ID groups.

**SON INS I2^23-1 48c** — Insert an inverted OC-48c 2^23-1 test pattern into all STS ID groups.

**SON INS 2^31-1 48c** — Insert an OC-48c 2^31-1 test pattern into all STS ID groups.

**SON INS I2^31-1 48c** — Insert an inverted OC-48c 2^31-1 test pattern into all STS ID groups.

See also: **SONet DS1 CHAnnel TX** and **SONet OUTput**

## SONet LEDs — Print State of SONET Status and Alarm LEDs

**SON LED**

This command prints the state of the SONET Status and Alarm LEDs.

See also: **LEDs**

EXAMPLE:

```
>SON LED (Print state of the SONET Status and Alarm LEDs.)

— SONET alarms — H   C
SEF             OFF OFF
LOF             OFF OFF
LINE AIS        OFF OFF
LINE RDI        OFF OFF
PATH AIS        OFF OFF
PATH RDI        OFF OFF
PATH LOP        OFF OFF
VT AIS          OFF OFF
VT RDI          OFF OFF
VT LOP          OFF OFF

>
```

## SONet OUTput — SONET Output Signal Source

**SON OUT ?**

Print current SONET output transmit rate and connection used. This command requires the 310-12, 310-13T, 310-14T, or 310-21option.

**NOTE**

To disable the OC-1/3/3c, OC-12/12c, or OC-48/48c transmitter, select STS-1.

**SON OUT STM-1**

Select the side-panel OC-1/3 TRANSMIT connector on the 310-14T option to transmit the STM-1 signal.

**SON OUT STS-1**

Select side-panel STS-1 TRANSMIT connector on the 310-13T or 310-14T option to transmit an STS-1 signal. Use the **STS TX LEVel** command to set transmit level.

**SON OUT OC-1**

Select side-panel OC-1/3 TRANSMIT connector on the 310-14T option to transmit an OC-1 signal.

**SON OUT OC-3**

Select side-panel OC-1/3 TRANSMIT connector on the 310-14T option to transmit an OC-3 signal. Use the **SONet STS ID TX** command to select the STS-1 being inserted.

**SON OUT OC-12**

Select side-panel OC-12 TRANSMIT connector on the 310-12 option to transmit an OC-12 signal. Use the **SONet STS ID TX** command to select the STS-1 being inserted.

**SON OUT OC-48**

Select side-panel OC-48 TRANSMIT connector on the 310-21 option to transmit an OC-48 signal. Use the **SONet STS ID TX** command to select the STS-1 being inserted.

**SON OUT THR**

Connect a SONET receiver input with the appropriate SONET transmitter output, i.e., STS-1 in to STS-1 out, OC-1 in to OC-1 out, OC-3 in to OC-3 out, and OC-12 in to OC-12 out. Set rate and select the connections with the **SONet INPut** command. Select STS-1 signal to be tested with the **SONet STS ID RX** command. Insert frame word errors, Section BIP errors, or Line BIP errors with the **SONet ERRor INSert** command. This command requires the 310-12, 310-13R/T pair, or 310-14R/T pair option.

See also: **STS TX LEVel, SONet STS ID TX, SONet INPut, SONet STS ID RX,** and **SONet ERRor INSert**

## SONet STS ID RX — SONET Input Signal Source, STS ID

**SON STS ID RX ?**

Print current OC-3, OC-12, or OC-48 STS ID to be analyzed. Use the **SONet INPut** command to select the input signal. This command requires the 310-12, 310-14R, or 310-21 option.

**SON STS ID RX [ 1 to 3 ]**

Select STS ID to be analyzed from an OC-3 signal.

**SON STS ID RX [ 1 to 12 ]**

Select STS ID to be analyzed from an OC-12 signal. This command requires the 310-12 option.

**SON STS ID RX [ 1 to 48 ]**

Select STS ID to be analyzed from an OC-48 signal. This command requires the 310-21 option.

**NOTE**

If you select an STS ID that is part of an OC-3c tributary, the entire OC-3c signal is analyzed.

See also: **SONet INPut**

## SONet STS ID TX — SONET Output Signal Source, STS ID

**SON STS ID TX ?**

Print current OC-3, OC-12, or OC-48 STS ID to be inserted. Use the **SONet OUTput** command to select the output signal. This command requires the 310-12, 310-14R, or 310-21 option.

**SON STS ID TX [ 1 to 3 ]**

Select STS ID to be inserted in an OC-3 signal.

**SON STS ID TX [ 1 to 12 ]**

Select STS ID to be inserted in an OC-12 signal. This command requires the 310-12 option.

**SON STS ID TX [ 1 to 48 ]**

Select STS ID to be inserted in an OC-48 signal. This command requires the 310-21 option.

**NOTE**

This command is not applicable when inserting (or generating) an OC-3c tributary. The same OC-3c tributary signal is generated for the OC-3 payload.

See also: **SONet INPut**

## SONet TIMing — SONET Transmit Timing Source

**SON TIM ?**

Print current SONET transmit timing source. If a DS1 bit-synchronous or DS1 byte-synchronous payload is inserted into the SONET signal, the message "(payload)" appears and the timing cannot be changed. This command requires the 310-13T or 310-14T option.

**SON TIM DS1 BIT CLK**

Select timing source connected to the side-panel DS1 BITS CLOCK connector.

**SON TIM INT**

Select internal clock to transmit the SONET signal.

**SON TIM REC**

Select recovered clock generated from the received SONET signal which is selected through the **SONet INPut** command. This command requires the 310-13R or 310-14R option.

See also: **SONet INPut** and **SONet INSert**

## SPE POInter — Synchronous Payload Envelope Pointer Control

**SPE POI ?**

Print current synchronous payload envelope (SPE) payload pointer. The SPE pointer cannot be manipulated while in SONET THRU mode, or inserting Line or Path AIS or LOP. This command requires the 310-13T or 310-14T option.

**SPE POI DEC**

Decrement the SPE payload pointer by one from 782 to 0.

**SPE POI INC**

Increment the SPE payload pointer by one from 0 to 782.

**SPE POI NDF [ +2 | -2 ]**

Change the NDF to adjust the SPE payload pointer by +2 or -2 bytes.

See also: **SONet INPut** and **SONet INSert**

---

## STS RX LEVel — STS Receive Level

**STS RX LEV ?**

Print current STS input signal level range for the side-panel STS-1 RECEIVE connector. This command requires the 310-13R or 310-14R option.

**STS RX LEV DSX**

Select for signal levels received at a DSX level.

**STS RX LEV HIG**

Select for signal levels received at a high level.

---

## STS TX LEVel — STS Transmit Level

**STS TX LEV ?**

Print current STS output signal level for the side-panel STS-1 TRANSMIT connector. This command requires the 310-13T or 310-14T option.

**STS TX LEV DSX**

Select to transmit the STS signal at a DSX level.

**STS TX LEV HIG**

Select to transmit the STS signal at a high level.

---

## SONet TX TOH — Print All Transmitted SONET Overhead Bytes

**SON TX TOH**

Prints all transmitted SONET Overhead bytes (in Hex form) in table format.

---

## SONet USER1 BYTe — Set Transmitted SONET USER1 Byte

**SON USER1 BYT**

Sets the transmitted SONET USER1 byte in Hex value.

---

## SONet USER2 BYTe — Set Transmitted SONET USER2 Byte

**SONet USER2 BYTe**

Sets the transmitted SONET USER2 byte in Hex value.

## TERminal — Enter Terminal Mode

**TER ( . )**

This command places the T-BERD 310 in the terminal control mode from the local or remote mode. The command enables the **PROmpt** and **ECHo** commands and disables front-panel switches (except **RESULTS** switches). The command also sets the **PRInt TERminator** command to **CRLf** and the **PRInt WIDth** command to **80**. The message *232 REMOTE CONTROL* flashes in the MODE/PATTERN window. A period ( . ) can be used in place of **TER**.

See also: **PROmpt, ECHo, LOCal,** and **REMote**

EXAMPLE (local to terminal mode):

(Enter **TER** or ".". The T-BERD 310 (and 310-1) enters local mode. The command is not echoed back from the T-BERD 310.)

```
Terminal mode activated.
Enter "HELP" or "?" followed by <RETURN> for help.
>
```

## TESt LENgth — Set Timed Test Length

**TES LEN ?**

Print current timed test length. This command is required when the **TESt** command is set to **TIMed**. If the **PRInt EVEnt** command is set to **TESt END**, a timed test result printout is generated at the end of the test.

**TES LEN <hhh:mm>**

Set test length time in hours and minutes from 000:01 to 999:59.

See also: **TESt** and **PRInt EVEnt**

## TESt — Set Test Duration

**TES ?**

Print current test duration of the test being performed.

**TES CON**

Set to continuous testing. The test results indicate accumulative counts since test restart.

**TES TIM**

Set to timed testing. Set test length with the **TESt LENgth** command. The test results indicate accumulative counts since test restart.

## TOH BYTe — Set Transmitted SONET Overhead Byte

**TOH BYTe [<variable> <range>]**

Possible variables are: A1, A2, C2, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, F1, F2, G1, K1, K2, Z1, Z2, Z3, Z4, and Z5.

## TRAnsmit OUTput — Set DS3 Transmit Output Level

**TRA OUT ?**
Print current DS3 transmit output level. This command controls the output of the front- and side-panel DS3 outputs.

**TRA OUT HIG**
Set DS3 transmit output level to HIGH.

**TRA OUT DSX**
Set DS3 transmit output level to DSX.

**TRA OUT LOW**
Set DS3 transmit output level to LOW.

## TRAnsmit TIMing — Set DS3 Transmit Timing Source

**TRA TIM ?**
Print current DS3 transmit timing source. If the DS1 INSERT mode is selected, the DS3 transmit timing source defaults to recovered timing.

**TRA TIM INT**
Set DS3 transmit timing source to INTERNAL.

**TRA TIM EXT**
Set DS3 transmit timing source to EXTERNAL.

**TRA TIM REC**
Set DS3 transmit timing source to RECOVERED.

## TX X-Bit — Set Transmitted X-Bit Pattern

**TX X-B ?**
Print current transmitted X-bit setting.

**TX X-B [ 00 | 11 ]**
Set transmitted X-bits to 00 or 11 ($X_0$ $X_1$).

**TX X-B EMU**
Set transmitted X-bit setting to EMULATE. EMULATE causes the T-BERD 310 to automatically transmit the X-bits according to the received signal frame status.

## USER1 — Set User-Programmable Test Pattern

**USER1 ?**
Print current user-programmable 3- to 24-bit test pattern. The command only applies when the **USER1** test pattern is selected with the **PATTern** command. The pattern is transmitted from left to right.

**USER1 [ 000 | 001 to 111111111111111111111111 ]**
Set test pattern in a binary format from 000 to 111111 111111 111111 111111.

See also: **PATTern**

## WDM RX MODe — Set Dense Wavelength Division Multiplexing Receive

**WDM RX MODe ?**
Print current DWDM receive operating mode. This command requires the 310-22 option.

**WDM RX MOD SCAn**
Enables contiguous channel scanning of DWDM optical signals for spectral analysis measurements.

**WDM RX MOD DROp**
Enable single channel to be isolated and dropped for DWDM optical analysis.

## WDM RX UNIts — Set Dense Wavelength Division Multiplexing Units

**WDM RX UNIts ?**
Print current WDM Receive measurement units for either wavelength (nanometers) or frequency (Terahertz). This command requires the 310-22 option.

**WDM RX UNI NM**
Select the display units for WDM RX Channels. Set **NM** as the valid selection in the units window to measure wavelength.

**WDM RX UNI THZ**
Select the display units for WDM RX Channels. Set **THZ** as the valid selection in the units window to measure frequency.

## WDM RX CHAnnel — Set Dense Wavelength Division Multiplexing Channel Select

**WDM RX CHAnnel ?**
Print current DWDM Receive channel selected from the valid, available channels in the Channel Scan Mode.

**WDM RX CHA NEXt**
Selects next available channel as the valid selection in the units window.

**WDM RX CHA PREv**
Selects previous available channel as the valid selection in the units window.

## WDM RX PEAk THReshold — Set Wavelength Division Multiplexing Peak Threshold

**WDM RX PEAk THReshold ?**
Print current peak threshold detecting criteria used to identify DWDM channels. This command requires the 310-22 option.

**WDM RX PEA THR < parameters between 0 - 40 dB >**
Sets peak threshold (measured in nm) to valid selection used to measure wavelength (see T-BERD 310 Communications Analyzer User's Guide, Section 2.75.4).

**WDM RX PEAk EXCursion** — **Set Wavelength Division Multiplexing Peak Excursion**

**WDM RX PEAk EXCursion ?**

Prints current peak excursion detecting criteria used to identify DWDM channels. This command requires the 310-22 option.

**WDM RX PEA EXCursion < parameters between 1 - 30 dB >**

Sets peak excursion (measured in THZ) to the valid selection to measure frequency (see T-BERD 310 Communications Analyzer User's Guide, Section 2.74.4).

## 2.3 310-1 DS1/DS0 ANALYZER OPTION COMMANDS

The following remote control commands apply to the T-BERD 310-1 DS1/DS0 Analyzer Option controls, indicators, connections, displays, and auxiliary functions. Note that each command begins with "@" unless otherwise indicated.

**@CHAnnel FMT** — **Channel Format Select**

**@CHA FMT ?**

Print current channel format for full T1 or Fractional-T1 (FT1) testing. This command requires the 310-9B option.

**@CHA FMT FUL**

Select full T1 channel format. All of the other operating modes can be selected.

**@CHA FMT NX64**

Select Nx64 FT1 channels. Use the **@FRACtional-t1 TYPe** command to select the contiguous or non-contiguous channel format.

See also: **@MODe** and **@FRACtional-t1 TYPe**

**@CODe** — **Set DS1 Line Code Type**

**@COD ?**

Print current transmitted DS1 line code status.

**@COD AMI**

Set DS1 line code to alternate mark inversion (AMI).

**@COD B8Z**

Set DS1 line code to B8ZS encoding.

See also: **@MODe**

## @CONTIguous — FT1 Contiguous Channel Select

**@CONTI ?**

Print current FT1 contiguous base channel and bandwidth. Select FT1 testing with the **@CHAnnel FMT** command. Enable contiguous FT1 testing with the **@FRActional-t1 TYPe** command. This command requires the 310-9B option.

**@CONTI <base_channel,bandwidth>**

Select **<base_channel,xx>** from 1 to 24. Select **<xx,bandwidth>** from 24 to 1.

See also: **@FRActional-t1 TYPe, @CHAnnel FMT,** and **@NON CONtiguous**

## @CONTRols — Generate Controls Printout

**@CONTR**

This command generates a controls printout of the 310-1 front panel configuration. The **@PRInt CONtrols** command performs the same function.

See also: **@PRInt CONtrols**

## @DATaport — Set DATAPORT Output

**@DAT ?**

Print current side-panel DATAPORT output status.

**@DAT DAT**

Set DATAPORT output to access either the ESF, optional ESFz, or SLC-96 datalink. The **MODe** command must be set to either T1 ESF, optional T1 ESFz, or T1 SLC-96 respectively.

**@DAT DS0**

Set DATAPORT output to access a DS0 channel. The DS0 channel is selected with the **@DS0 DROp CHAnnel** command.

See also: **@DS0 DROp CHAnnel** and **@MODe**

## @DISplay HOLd — Set Display Hold

**@DIS HOL ?**

Print current display hold status.

**@DIS HOL ON**

Activate the display hold function. The results and the Status and Alarm LEDs are frozen.

**@DIS HOL OFF**

Disable the display hold function. The results and the Status and Alarm LEDs are released and updated.

**NOTE**

While the **@DISplay HOLd** command is ON, updated results can be checked with the **@RES1** or **@RES2** command. Additionally, when in IEEE-488 remote control mode, the **DISPLAY HOLD** switch allows the user to return to local mode. The switch flashes when pressed to indicate an action is taking place.

See also: **@PRInt** and **@RESUlts**

## @DS0 DROp CHAnnel — Set Dropped DS0 Channel

**@DS0 DRO CHA ?**
Print current dropped DS0 channel.

**@DS0 DRO CHA 1 to 24**
Select DS0 channel to be dropped. DS0 channels are entered with numbers from 1 to 24.

**@DS0 DRO CHA NON**
Set DS0 channel to be dropped to none.

## @DS1 SOUrce — Set DS1 Input Source

**@DS1 SOU ?**
Print current DS1 source input status.

**@DS1 SOU DS3 DRO**
Set DS1 source input source to the received DS3 signal. The DS1 signal is dropped from the DS3 signal received at the DS3 RECEIVE connector.

**@DS1 SOU EXT INP**
Set DS1 source input to the external input. The DS1 signal is received from the side-panel DS1 RECEIVE connector.

**@DS1 SOU SON DRO**
Set DS1 input source to the received SONET signal. The DS1 signal is dropped from the side-panel STS-1, OC-1/3/3c, OC-12/12c, or OC-48/48c RECEIVE connection. Requires a SONET option.

## @ERRor INSert BPV — Execute BPV Insertion

**@ERR INS BPV ?**
Print current BPV insertion setting.

**@ERR INS BPV OFF**
Disable the continuous BPV insertion. This command only applies when the **RATe** parameter is used.

**@ERR INS BPV RAT**
Insert continuous BPVs at a $10^{-3}$ error rate.

**@ERR INS BPV SIN**
Insert a single BPV.

See also: **@ERRor INSert LOGic**

## @ERRor INSert LOGic — Execute Logic Error Insertion

**@ERR INS LOG ?**
Print current DS1 logic error insertion setting.

**@ERR INS LOG OFF**

Disable the continuous logic error insertion. This command only applies when the **RATe** parameter is used.

**@ERR INS LOG RAT**

Insert continuous logic errors at a $10^{-3}$ error rate.

**@ERR INS LOG SIN**

Insert a single logic error.

See also: **@ERRor INSert BPV**

## @ESF LOOp — Set ESF Loop Code Type

**@ESF LOO ?**

Print current ESF loop code type setting. This only applies when transmitting loop codes in the T1 ESF mode and the 310-9B option is installed.

**@ESF LOO IN BAN**

Select ESF in-band loop codes.

**@ESF LOO OUT OF BAN**

Select ESF out-of-band loop codes.

See also: **@LOOp CODe** and **@MODe**

## @FRActional-t1 TYPe — FT1 Channel Format Select

**@FRA TYP ?**

Print current channel format for Fractional-T1 (FT1) testing. Enable FT1 testing with the **@CHAnnel FMT NX64** command. This command requires the 310-9B option.

**@FRA TYP CON**

Select Nx64 contiguous FT1 channels. Set base channel and bandwidth with the **@CONTIguous** command.

**@FRA TYP N-C**

Select Nx64 non-contiguous FT1 channels. Set timeslots with the **@NON CONtiguous** command.

See also: **@CHAnnel FMT, @CONTIguous,** and **@NON CONtiguous**

## @HELP — Display On-Line Help

**@HELP (?)**

Use **@HELP** or **@?** to print current introduction to the 310-1 help pages. The help page identifies the command syntax for entering commands and a list of the available help page commands. The "**@?**" can be used in place of **@HELP** in the following commands. Use the page number (e.g., **? 4**) or the page name (e.g., **? FRO**) to select the required help page.

**@HELP !**

List all the available 310-1 remote control commands.

**@HELP [ 7 | FRO ]**

List the 310-1 front-panel remote control commands.

**@HELP [ 8 | AUX ]**

List the 310-1 auxiliary function remote control commands.

**@HELP <command-name>**

Describe the **<command-name>** and any parameters in detail. Do not use the **@** sign in the **<command-name>**.

See also: **HELP**

## @HIStory RESet — Clear History Alarm LEDs

**@HIS RES**

Clear any illuminated 310-1 History Alarm LEDs.

See also: **@LEDs**

## @LEDs — Print State of Status and Alarm LEDs

**@LED**

This command prints the state of the Status and Alarm LEDs.

See also: **@HIStory RESet**

EXAMPLE:

```
> @LED
 ___________________________________________________
|          - alarms -            |      - status -  |
|    OFF  OFF  signal  loss      |    ON   T1 pulses|
|    OFF  OFF  frame   loss      |    ON   frame sync|
|    OFF  OFF  pattern loss      |    ON   pattern sync|
|    ON   OFF  excess zeros      |    ON   b8zs     |
|    OFF  OFF  yellow alarm      |__________________|
|    OFF  OFF  all ones          |
|                                |
|      _____   history           |
|________________________________|
>
```

## @LOOp CODe — Set DS1 Loop Code Type

**@LOO COD ?**

Print current DS1 loop code transmitted through DS1 in-band (CSU, FAC1, FAC2, and PGM) and ESF out-of-band (**LINe**, **NETwork**, and **PAYload**) loop code. The ESF out-of-band loop codes only apply when transmitting loop codes in the T1 ESF and optional T1 ESFz modes and the 310-9B option is installed.

**@LOO COD CSU**

Set loop code type to CSU.

**@LOO COD FAC1**

Set loop code type to Facility 1.

**@LOO COD FAC2**
Set loop code type to Facility 2.

**@LOO COD PGM**
Set loop code type to Programmable. Use the **@PGM LPDn** and **@PGM LPUp** commands to program the loop codes.

**@LOO COD LIN**
Set ESF out-of-band loop code type to LINE.

**@LOO COD NET**
Set ESF out-of-band loop code type to NETWORK.

**@LOO COD PAY**
Set ESF out-of-band loop code type to PAYLOAD.

See also: **@ESF LOOP, @LOOp DOWn, @LOOp UP, @PGM LPDn,** and **@PGM LPUp**

## @LOOp DOWn — Generate Loop-Down Code

**@LOO DOW ?**
Print current generated loop-down code status.

**@LOO DOW ON**
Transmit the loop-down code.

**@LOO DOW OFF**
Disable the transmitted loop-down code.

See also: **@ESF LOOp, @LOOp CODe,** and **@LOOp UP**

## @LOOp UP — Generate Loop-Up Code

**@LOO UP ?**
Print current generated loop-up code status.

**@LOO UP ON**
Transmit the loop-up code.

**@LOO UP OFF**
Disable the transmitted loop-up code.

See also: **@ESF LOOp, @LOOp CODe,** and **@LOOp DOWn**

## @MODe — Set Transmit and Receive Operating Mode

**@MOD ?**
Print current 310-1 transmit and receive operating mode. Enable full T1 or FT1 testing with the **@CHAnnel FMT** command.

**@MOD AUT**
Select automatic configure frame and pattern mode.

**@MOD T1 D4**
Select T1 D4 mode.

**@MOD T1 ESF**

Select T1 ESF mode.

**@MOD T1 SLC**

Select T1 SLC mode.

**@MOD T1**

Select T1 unframed mode.

**@MOD SCA**

Select DS1 scan mode.

See also: **@CHAnnel FMT**

## @NON CONtiguous — FT1 Non-Contiguous Channel Select

**@NON CON ?**

Print current non-contiguous FT1 channel format. Select FT1 testing with the **@CHAnnel FMT** command. Enable contiguous FT1 testing with the **@FRActional-t1 TYPe** command. This command requires the 310-9B option.

**@NON CON <123456789012345678901234>**

Select non-contiguous FT1 channel by entering 1s for the FT1 channel and 0s for the idle channels. For example, to enter an FT1 channel starting with the base channel 4 and a bandwidth of 5 which includes every third timeslot, enter the command as follows:

```
>@NON CON 000100100010001000000000
 (chan    123456789012345678901234)
```

See also: **@CONTIguous** and **@CHAnnel FMT**

## @PATtern — Set Data Pattern

**@PAT ?**

Print current transmitted test pattern.

**@PAT <pattern>**

Select test pattern from the following list.

**1:1** — Select 1:1 pattern.

**1:7** — Select 1:7 pattern.

**2^15-1** — Select 32,767-bit pseudorandom pattern.

**2^20-1** — Select 1,048,575-bit pseudorandom pattern.

**2^23-1** — Select 8,388,607-bit pseudorandom pattern.

**3/24** — Select 3 IN 24 pattern.

**55OCTET** — Select 55 Octet pattern. Requires 310-9B option.

**ALL ONE** — Select All Ones pattern.

**ALL ZER** — Select All Zeros pattern.

**ATM (PLCP)** — Selects the DS1 ATM payload patterns to PLCP format while in T1 D4, T1 ESF, or T1 SLC framing. Requires the 310-17A option.

**ATM (HEC)** — Selects the DS1 ATM payload patterns to HEC format while in T1 D4, T1 ESF, or T1 SLC framing. Requires the 310-17A option.

**CON** — Select continuous DS1 scan mode.

**IDLe code** — Select Idle Code. Must select **@MODe T1D4** or **@MODe T1ESF** to transmit pattern.

**MINMAX** — Select Minimum/Maximum pattern. Requires 310-9B option.

**QRS** — Select QRSS pattern.

**T12** — Select T1-2 pattern. Do not use pattern in T1 D4 or T1 SLC framing. Requires 310-9B option.

**T13** — Select T1-3 pattern. Requires 310-9B option.

**T14** — Select T1-4 pattern. Requires 310-9B option.

**T15** — Select T1-5 pattern. Requires 310-9B option.

**T1DALY** — Select T1-DALY pattern. Requires 310-9B option.

**TRI** — Select triggered DS1 scan mode. Requires 310-1 option.

**USER1** — Select fixed 3- to 24-bit user-programmable test pattern. Use the **@USER1** command to set test pattern.

See also: **@USER1** and **@MODe**

## @PGM LPDn — Set Programmable Loop-Down Code

**@PGM LPD ?**

Print current DS1 3- to 8-bit programmable loop-down code. Set **@LOOp CODe** command to **PGM** to select loop code. Set **@LOOp DOWn** command to **ON** to transmit the loop code. The pattern is transmitted from left to right.

**@PGM LPD [ 000 | 001 to 11111111 ]**

Set loop-down code in a binary format from 000 to 11111111.

See also: **@LOOp CODe** and **@LOOp UP**

## @PGM LPUp — Set Programmable Loop-Up Code

**@PGM LPU ?**

Print current DS1 3- to 8-bit programmable loop-up code. Set **@LOOp CODe** command to **PGM** to select loop code. Set **@LOOp UP** command to **ON** to transmit the loop code. The pattern is transmitted from left to right.

**@PGM LPU [ 000 | 001 to 11111111 ]**

Set loop-up code in a binary format from 000 to 11111111.

See also: **@LOOp CODe** and **@LOOp DOWn**

## @PRInt CONtrols — Generate Controls Printout

**@PRI CON**

This command generates a controls printout of the 310-1 front panel configuration. The **@CONTRols** command performs the same function.

See also: **@CONTRols**

EXAMPLE:

```
> @PRI CON (Print 310-1 front-panel configuration.)

            DS1 CONTROLS PRINT

AUG 12                          12:18:12

  DS1 PANEL SETTINGS

    Mode:                          T1
    Pattern:                     QRSS
    DS1 Source:                DS3 DROP
    TX Timing:                 INTERNAL
    Code:                        AMI
    Logic Err Insert:            OFF
    BPV Err Insert:              OFF
    Loop Up Code:                OFF
    Loop Down Code:              OFF
    DS0 Drop Channel:             24
    RX Input:                    TERM

  AUX FUNCTIONS

    User1:                     100000
    Pgm Loop Up:                10000
    Pgm Loop Down:                100
    Loop Code:                    CSU
    Data Port:                    DS0
                  .
                  .
                  .

            END OF PRINTOUT
```

## @PRInt CUStom — Set Custom Results Printout

**@PRI CUS ?**

Print current selected test results for the custom results printout. The custom results printout is selected with the T-BERD 310 **PRInt FORmat** command set to **CUStom.** The custom results printout is generated with the **@PRInt RESults** or **@RESUlts** command.

**@PRI CUS <result name> ON**

Set **<result name>** to ON. A **<result name>** that is set to ON is printed in the custom results printout.

**@PRI CUS <result name> OFF**

Set **<result name>** to OFF. A **<result name>** that is set to OFF is not printed in the custom results printout.

**@PRI CUS ALL ON**

Set ALL the **<result names>** and Status and Alarm LEDs to ON. The custom results printout lists all the test results.

**@PRI CUS ALL OFF**

Set ALL the **<result names>** and Status and Alarm LEDs to OFF. The custom results printout header is generated without the results.

Refer to the following list for 301-1 Status and Alarm LED **<result names>**. Refer to the **@PRInt** command for a list of test **<result names>**.

**DS1 Status LEDs**

T1 PULSES

FRAME SYNC

PATTERN SYNC

B8ZS

***DS1 Alarm LEDs***

SIGNAL LOSS

FRAME LOSS

PATTERN LOSS

EXCESS ZEROS

YELLOW ALARM

ALL ONES

See also: **@PRInt RESults** and **@RESUlts**

## @PRInt RESults — Generate Test Results Printout

**@PRI RES**

This command generates a 310-1 test results printout.

See also: **@RESUlts**

EXAMPLE:

```
> @PRI RES (Print test results.)

          NORMAL RESULTS PRINT

Manual                              AUG 12
Continuous                        12:23:58

             DS1 TEST RESULTS

  DS1 STATUS

    T1 Pulses:                      ON
    Frame Sync:                     OFF
    Pattern Sync:                   ON
    B8ZS:                           OFF

                        .
                        .
                        .
             END OF PRINTOUT

>
```

## @PRInt — Print Selected Test Result

**@PRI <result name>**

This command prints the selected 310-1 test result value.

LOGIC Category

| | |
|---|---|
| %EFS | Percentage of Error-Free Seconds |
| ASYNC ERR SEC | Asynchronous Errored Seconds |
| BIT ERR RT | Bit Error Rate |
| BIT ERRORS | Bit Errors |
| CSES | Consecutive Severely Errored Seconds |
| SEV ERR SEC | Severely Errored Seconds |
| SLIPS | Pattern Slips |
| SYNC ERR SEC | Synchronous Errored Seconds |
| SYNC L SEC | Out-of-Synchronization Seconds |

LOGIC Category, G.821 Results Option

| | |
|---|---|
| % AVAIL SEC | % Available Seconds |
| % DEG MIN | % Degraded Minutes |
| % SEVERR SEC | % Severely Errored Seconds |
| AVAIL SECOND | Available Seconds |
| DEG MIN | Degraded Minutes |
| UNAVAIL SEC | Unavailable Seconds |

BPV Category

| | |
|---|---|
| BPV ERR RT | Bipolar Violation Rate |
| BPV ERR SEC | Bipolar Violation Seconds |
| VIOLATIONS | Bipolar Violations |

BPV Category, Enhanced DS1 Testing Option

| | |
|---|---|
| FAR BPV SEC | Far-End BPV Seconds |

FRAME Category

| | |
|---|---|
| CRC ERR RT | Cyclic Redundancy Check Error Rate |
| CRC ERR SEC | Cyclic Redundancy Check Errored Seconds |
| CRC ERRORS | Cyclic Redundancy Check Errors |
| CRC SES | Cyclic Redundancy Check Severely Errored Seconds |
| FRM ERR RT | Frame Error Rate |
| FRM ERR SEC | Frame Errored Seconds |
| FRM ERRORS | Frame Errors |
| FRM L SEC | Frame Loss Seconds |
| FRM SES | Frame Severely Errored Seconds |

FRAME Category, Enhanced DS1 Testing Option

| | |
|---|---|
| FAR CRC ERR | Far-End CRC Error Events |
| FAR FRM ES | Far-End Frame Error Seconds |
| FAR FRM SES | Far-End Severely Errored Framing Seconds |
| FAR SLIP SEC | Far-End Controlled Slip Seconds |
| FCRC 1 | Far-End CRC 1 Bin |
| FCRC 2-5 | Far-End CRC 2 to 5 Bin |
| FCRC 6-10 | Far-End CRC 6 to 10 Bin |
| FCRC 11-100 | Far-End CRC 11 to 100 Bin |
| FCRC 101-319 | Far-End CRC 101 to 319 Bin |
| FCRC >319 | Far-End CRC 320 to 333 Bin |
| PAYLOAD SOURCE | Far-End Payload Source/Loopback |

SIGNAL Category

| | |
|---|---|
| RX FREQ | Received Frequency in Hertz |
| RX LVL dBdsx | Received Signal Level in dBdsx |
| SIG BIT | Channel A/BC/D Signaling Status |
| SIG L SEC | Signal Loss Seconds |
| VF LVL dBm | Received Signal Level in dBm |

SIGNAL Category, Enhanced DS1 Testing Option

| | |
|---|---|
| TIMING SLIPS | DS1 Timing Slips |
| SYNC MSG | ESF Datalink Synchronization Message |

TIME Category

| | |
|---|---|
| DATE | Current Date |
| ELAPSED TIME | Elapsed Time |
| TEST LENGTH | Timed Test Length |
| TIME | Current Time of Day |
| TIME LEFT | Timed Test Time Left |

TIME Category, Enhanced DS1 Testing Option

| | |
|---|---|
| FAR PRM SEC | Far-End Performance Report Seconds |

See also: **@PRInt RESults, @RESUlts,** and **@RES1** or **@RES2**

## @PRM EMUlate — Set PRM Transmission Control

**@PRM EMU ?**

Print current PRM transmission control function. The command only applies when operating in the T1 ESF and optional T1 ESFz modes and the 310-9B option is installed.

**@PRM EMU CAR**

Set PRM transmission control function to carrier emulation.

**@PRM EMU CUS**

Set PRM transmission control function to customer emulation.

**@PRM EMU OFF**

Turn the PRM transmission control function OFF.

See also: **@PRM RECeive** and **@MODe**

## @PRM RECeive — PRM Results Analysis Control

**@PRM REC ?**

Print current PRM results analysis control function. The command only applies when operating in the T1 ESF and optional T1 ESFz modes and the 310-9B option is installed.

**@PRM REC ON**

Turn the PRM results analysis control function ON.

**@PRM REC OFF**

Turn the PRM results analysis control function OFF.

See also: **@PRM EMUlate**, **@PRInt**, and **@MODe**

## @RAW LEDs — Raw DS1/DS0 Signal LED Status

**@RAW LED**

Print current status of the DS1/DS0 signal status and alarm LEDs in a three byte hexadecimal format. Each byte represents the on (1) or off (0) status of the individual DS1/DS0 status and alarm LEDs as indicated in Table 2-4. Each byte (XX) relates to a specific group of LEDs. The table describes the three bytes, starting with the first byte, and the individual LED bit positions within each byte. The "XX" and "X" represent the specific hexadecimal byte and bit position for the specified LED. The following example identifies Byte 2 as having a hex value of 23 with a bit sequence of 0010 0011. This command is a hexadecimal equivalent to the **@LEDs** command. Requires the 310-1 option.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | | | Byte Number | |
| | 00 | 23 | 00 | | | Displayed Hex Bytes | |
| 0010 0011 | | | | | | Bit Pattern for Byte 2 | |
| | | | | | 1 | Signal Loss | ON |
| | | | | 1 | | Frame Loss | ON |
| | | | 0 | | | Pattern Loss | OFF |
| | | 0 | | | | Excess Zeros | OFF |
| | 0 | | | | | Yellow Alarm | OFF |
| 1 | | | | | | All Ones Alarm | ON |

**Table 2-4. DS1/DS0 Status and Alarm RAW LEDs Command**

| XX 00 00 | Byte 1 - Alarm History | |
|---|---|---|
| 0000 000**X** | Bit 0 | Signal Loss History |
| 0000 00**X**0 | Bit 1 | Frame Loss History |
| 0000 0**X**00 | Bit 2 | Pattern Loss History |
| 0000 **X**000 | Bit 3 | Excess Zeros History |
| 000**X** 0000 | Bit 4 | Yellow History |
| 00**X**0 0000 | Bit 5 | All Ones History |

| 00 XX 00 | Byte 2 - Alarm | |
|---|---|---|
| 0000 000**X** | Bit 0 | Signal Loss |
| 0000 00**X**0 | Bit 1 | Frame Loss |
| 0000 0**X**00 | Bit 2 | Pattern Loss |
| 0000 **X**000 | Bit 3 | Excess Zeros |
| 000**X** 0000 | Bit 4 | Yellow |
| 00**X**0 0000 | Bit 5 | All Ones |

| 00 00 XX | Byte 3 - Status | |
|---|---|---|
| 0000 000**X** | Bit 0 | Signal Present |
| 0000 00**X**0 | Bit 1 | Frame Sync |
| 0000 0**X**00 | Bit 2 | Pattern Sync |
| 0000 **X**000 | Bit 3 | B8ZS |

## @RECeive INPut — Set DS1 Receive Input Level

**@REC INP ?**
Print current DS1 RECEIVE connector receive input level.

**@REC INP BRI**
Set receive input to BRIDGE.

**@REC INP DSX**
Set receive input to DSX-MON.

**@REC INP TER**
Set receive input to TERM.

## @RES1 or @RES2 — Test Results Display I/II Control

**@RES1 or @RES2 ?**
Print current test result displayed in the RESULTS I or RESULTS II windows. Refer to the **@PRInt** command for a list of valid **<result names>**.

**@RES1 or @RES2 <result name>**
Display the **<result name>** in the RESULTS I or RESULTS II window.

See also: **@PRInt, @PRInt RESults,** and **@RESUlts**

## @RESTART — Initiate Test Restart

**@RESTART**
This command restarts the 310-1 test.

## @RESUlts — Generate Test Results Printout

**@RESU**

This command generates a 310-1 test results printout.

See also: **@PRInt RESults**

EXAMPLE:

```
> @RESU (Print current test results.)

           NORMAL RESULTS PRINT

Manual                                AUG 12
Continuous                          12:23:58

              DS1 TEST RESULTS

  DS1 STATUS

    T1 Pulses:                        ON
    Frame Sync:                       OFF
    Pattern Sync:                     ON
    B8ZS:                             OFF

                        .
                        .
                END OF PRINTOUT
```

## @SCAn TRIgger — Set Triggered DS1 Scan Mode Criteria

**@SCA TRI ?**

Print current triggered DS1 scan mode test criteria. One or all events can be enabled or disabled.

**@SCA TRI ALL ONE [ ON | OFF ]**

Enable/Disable the 310-1 to trigger on an All Ones signal.

**@SCA TRI CRC ERR [ ON | OFF ]**

Enable/Disable the 310-1 to trigger on a CRC error.

**@SCA TRI FRA ERR [ ON | OFF ]**

Enable/Disable the 310-1 to trigger on a frame error.

**@SCA TRI FRA LOS [ ON | OFF ]**

Enable/Disable the 310-1 to trigger on a frame loss.

**@SCA TRI FRA SYN [ ON | OFF ]**

Enable/Disable the 310-1 to trigger on a frame synchronization.

**@SCA TRI TM SLI [ ON | OFF ]**

Enable/Disable the 310-1 to trigger on a timing slip.

**@SCA TRI YEL ALA [ ON | OFF ]**

Enable/Disable the 310-1 to trigger on a Yellow Alarm.

## @SLIp REFerence — DS1 Timing Slip Reference Source

**@SLI REF ?**

Print current DS1 timing slip reference source for the TIMING SLIP result. Select DS1 test signal source with the **@DS1 SOUrce** command. Refer to the *T-BERD 310 User's Manual* for the relationship between the test signal source and the reference signal source. This command requires the 310-9B option.

**@SLI REF PRI DS3 DRO**

Select DS1 channel that is internally dropped from the DS3 RECEIVE connector. The DS1 channel is selected with the **DS1 DROp CHAnnel** command.

**@SLI REF SEC DS3 DRO**

Select DS1 channel that is internally dropped from the SECONDARY DS3 RECEIVE connector on the 310-3 option. The DS1 channel is selected with the **DS1 INSert CHAnnel** command.

**@SLI REF SON DRO**

Select DS1 channel that is internally dropped from the side-panel STS-1, OC-1/3/3c, OC-12/12c, or OC-48/48c RECEIVE connection. Select SONET DS1 payload channel through the **SONet DS1 CHAnnel RX** command. For the 310-13R or 310-14R option, select DS1 payload format with the **SONet DROp** command. Requires a SONET option.

**@SLI REF DS1 REC**

Select DS1 signal from the DS1 RECEIVE jack on the 310-1 option.

**@SLI REF DS1 INS**

Select DS1 signal from DS1 INSERT INPUT jack on the 310-3 option.

**@SLI REF DS1 BIT CLK**

Select DS1 clock rate signal from the side-panel DS1 BITS CLOCK jack on the 310-13T or 310-14T option.

See also: **DS1 DROp CHAnnel, DS1 INSert CHAnnel, SONet DS1 CHAnnel, @DS1 SOUrce,** and **@PRInt**

## @TRAnsmit TIMing — Set DS1 Transmit Timing Source

**@TRA TIM ?**

Print current DS1 transmit timing source.

**@TRA TIM INT**

Set DS1 transmit timing to INTERNAL.

**@TRA TIM REC**

Set DS1 transmit timing to RECOVERED.

## @USER1 — Set User-Programmable Test Pattern

**@USER1 ?**

Print current user-programmable 3- to 24-bit test pattern. The command only applies when the **@USER1** test pattern is selected with the **@PATtern** command. The pattern is transmitted from left to right.

**@USER1 [ 000 | 001 to 111111111111111111111111 ]**

Set test pattern in a binary format from 000 to 111111 111111 111111 111111.

See also: **@PATtern.**

# APPENDIX A
# REMOTE CONTROL MESSAGES

## A.1 INTRODUCTION

The following error, warning, and general messages appear when entering commands and/or parameters incorrectly. The error and warning messages are formatted with an ****ERROR* or ****WARNING* header, the problem, and in some cases the improperly entered command or parameter.

## A.2 ERROR MESSAGES

**Already transmitting FEAC control message** — A FEAC message or loop code is being transmitted. Use the **FEAc ALArms** or **FEAc LOOp** command to halt the transmission of the message or loop code.

**Bad command syntax** — The **command_name** was entered improperly. Reenter the first three characters of the **command_name** or as required. See the **HELP !** command for a list of valid **command_names**.

**Bad configuration parameter: xxxxx** — The indicated **[parameter]** was an invalid parameter for the setup configuration. Reenter the entire command string with the correct **[parameter]**. See the **HELP <command-name>** command for a list of valid **[parameters]**.

**Bad parameter: xxxxx** — The indicated **[parameter]** was entered improperly. Reenter the entire command string with the correct **[parameter]**. See the **HELP <command-name>** command for a list of valid **[parameters]**.

**Command line too long (255 character limit)** — The number of characters entered in the command line exceeds the 255 character limit. Reduce the character count and reenter the command.

**Framing errors not allowed in DS1 Insert mode** — Attempted to insert framing errors in the DS1 INSERT mode. Either do not insert framing errors in the DS1 INSERT mode or change the operating mode.

**Framing errors not allowed in Thru & Auto modes** — Attempted to insert framing errors in either the THRU or AUTO mode. Either do not insert framing errors in the THRU or AUTO mode or change the operating mode.

**Framing errors not allowed in Unframed mode** — Attempted to insert framing errors in the UNFRAMED mode. Either do not insert framing errors in the UNFRAMED mode or change the operating mode.

**Multiple required options not installed** — Option-specific text was detected in the command line. The previous command is only valid when the appropriate options are installed, i.e., the **PATTern INTernal DS1** command requires the 310-3 DS1 Insert Option and the 310-1 DS1/DS0 Analyzer Option.

**No such command: xxxxx** — The indicated **command_name** is not a valid command. See the **HELP !** command for a list of valid **command_names**.

**No such help page: xxxxx** — The indicated help page is not valid. See the **HELP** command for a list of valid page names and numbers.

**Not allowed in IEEE-488 mode** — The **command_name** is not allowed when operating the T-BERD 310 from an IEEE-488 controller, i.e., the **PRInt GRAph** command cannot be executed from an IEEE-488 controller.

**Not enough command words specified** — The **command_name** is incomplete. See the **HELP !** command for a list of valid **command_names**.

**Not enough letters specified: xxxxx** — The **command_name** does not have enough characters entered. See the **HELP <command-name>** command for a list of valid **command_names** or **[parameters]**.

**Not enough parameters specified** — The **[parameter]** in the command is incomplete. Use the **HELP <command-name>** command to list the valid **[parameters]** for the command.

**Operation not allowed; not originating frame** — The T-BERD 310 is not generating framing, i.e., AUTO or THRU mode, and the entered operation is not allowed, i.e., inserting a pattern, FEAC messages, or frame errors in AUTO mode.

**Operation not allowed; not transmitting C-bit** — The T-BERD 310 is not generating C-bit framing and the entered operation is not allowed, i.e., inserting FEAC messages.

**Page name too long: xxxxx** — The indicated help page name is longer than the longest valid help page name. See the **HELP** or **@HELP** command for a list of valid page names and numbers.

**Parameter out of range: xxxxx** — The previous **[parameter]** exceeds the command parameter limits. Reenter the entire command string with the correct **[parameter]**. See the **HELP <command>** command for a list of valid **[parameters]**.

**Parameter(s) required** — The **command_name** requires a **[parameter]**. See the **HELP <command>** command for a list of valid **[parameters]**.

**Pattern not changeable in current mode** — The selected pattern cannot be changed in the current operating mode. Either change the test pattern or operating mode.

**Pattern not supported by current mode** — The previous test pattern is not valid for the current operating mode. Change either the test pattern or operating mode.

**Remote Control cannot modify this setting** — An attempt was made to modify the **PRInt PARity** or **PRInt BAUd RATe** command.

**Required option not installed** — Option-specific text was detected. The previous command is only valid when the appropriate option is installed.

**Result not supported by current ROM revision** — The current software does not support the selected test result.

**That operation is not relevant to the current mode** — The previous operation does not apply to the current operating mode. The operation succeeded, but it has no effect on the current mode.

**Too many command words specified** — The **command_name** is too long. See the **HELP !** command for a list of valid **command_names**.

**Too many parameters specified** — The number of **[parameters]** exceeds the command requirements. Use the **HELP <command-name>** command to list the valid **[parameters]** for the command.

## A.3 WARNING MESSAGES

**Current configuration forces Recovered Timing mode** — The transmit timing mode was changed to either internal or external and the configuration requires recovered timing. The instrument defaults to recovered timing.

**DS1's present in selected DS2; channel may differ** — An E1 channel number was entered with the **DS1 DROp CHAnnel** command and the DS2 frame actually contains DS1 channels.

**E1's present in selected DS2; channel may differ** — A DS1 channel number was entered with the **DS1 DROp CHAnnel** command and the DS2 frame actually contains E1 channels.

**Prompt string too long, truncated** — The entered **<prompt string>** exceeds the 32 character length limit and was truncated.

**Seconds value ignored** — Seconds were entered in the **PRInt INTerval** command and none were required.

**T1 linecode forced to AMI when transmitting ZBTSI** — The **@CODe B8Zs** command was entered when the **@MODe T1 ESFZ** command is established. The DS1/DS0 Analyzer Option defaults to AMI coding when the T1 ESFz mode is selected.

## A.4 GENERAL MESSAGES

**Result N/A** — The selected test result does not apply to the current configuration. See the **PRI**, **RES1**, or **RES2** command.

**Result unavailable** — The selected test result is not available. See the **PRI**, **RES1**, or **RES2** command.

# INDEX

## — Symbols —

@CHAnnel FMT Command
DS1/DS0 analyzer option 2-59
@CODe Command
DS1/DS0 analyzer option 2-59
@CONTIguous Command
DS1/DS0 analyzer option 2-60
@CONTRols Command
DS1/DS0 analyzer option 2-60
@DATaport Command
DS1/DS0 analyzer option 2-60
@DISplay HOLd Command
DS1/DS0 analyzer option 2-60
@DS0 DROp CHAnnel Command
DS1/DS0 analyzer option 2-61
@DS1 SOUrce Command
DS1/DS0 analyzer option 2-61
@ERRor INSert BPV Command
DS1/DS0 analyzer option 2-61
@ERRor INSert LOGic Command
DS1/DS0 analyzer option 2-61
@ESF LOOp Command
DS1/DS0 analyzer option 2-62
@FRActional-t1 TYPe Command
DS1/DS0 analyzer option 2-62
@HELP Command
DS1/DS0 analyzer option 2-62
@HIStory RESet Command
DS1/DS0 analyzer option 2-63
@LEDs Command
DS1/DS0 analyzer option 2-63
@LOOp CODe Command
DS1/DS0 analyzer option 2-63
@LOOp DOWn Command
DS1/DS0 analyzer option 2-64
@LOOp UP Command
DS1/DS0 analyzer option 2-64
@MODe Command
DS1/DS0 analyzer option 2-64
@NON CONtiguous Command
DS1/DS0 analyzer option 2-65
@PATtern Command
DS1/DS0 analyzer option 2-65
@PGM LPDn Command
DS1/DS0 analyzer option 2-66
@PGM LPUp Command
DS1/DS0 analyzer option 2-66
@PRInt Command
DS1/DS0 analyzer option 2-69
@PRInt CONtrols Command
DS1/DS0 analyzer option 2-67
@PRInt CUStom Command
DS1/DS0 analyzer option 2-67
@PRInt RESults Command
DS1/DS0 analyzer option 2-68
@PRM EMUlate Command
DS1/DS0 analyzer option 2-71
@PRM RECeive Command
DS1/DS0 analyzer option 2-71
@RAW LEDs Command
DS1/DS0 analyzer option 2-71
@RECeive INPut Command
DS1/DS0 analyzer option 2-72
@RES1 or @RES2 Command
DS1/DS0 analyzer option 2-72
@RESTART Command
DS1/DS0 analyzer option 2-72
@RESUlts Command
DS1/DS0 analyzer option 2-73
@SCAn TRIgger Command
DS1/DS0 analyzer option 2-73
@SLIp REFerence Command
DS1/DS0 analyzer option 2-74
@TRAnsmit TIMing Command
DS1/DS0 analyzer option 2-74
@USER1 Command
DS1/DS0 analyzer option 2-74

## — A —

ALArms Command
mainframe 2-1
Already transmitting FEAC control message.
error message A-1
ATM CELl BANdwidth Command
mainframe 2-2
ATM CORrelation Command
mainframe 2-2

ATM HEC ERRor INSert Command
mainframe 2-2
ATM HEC ERRor RATe Command
mainframe 2-3
ATM LEDS Command
mainframe 2-3
ATM OAM FLOw Command
mainframe 2-3
ATM OAM INSert Command
mainframe 2-4
ATM PEAk BANdwidth Command
mainframe 2-4
ATM PEAk DURation Command
mainframe 2-4
ATM PLCp ERRor INSert Command
mainframe 2-5
ATM PLCp ERRor RATe Command
mainframe 2-5
ATM PLCp ERRor TYPe Command
mainframe 2-6
ATM PROfile BASe Command
mainframe 2-5
ATM RATe SELect Command
mainframe 2-6
ATM Rate Selection Control 2-6
ATM RX BANdwidth PERiod Command
mainframe 2-6
ATM RX NETwork INTerface Command
mainframe 2-6
ATM RX PREview Command
mainframe 2-7
ATM RX PROfile Command
mainframe 2-7
ATM RX SCRamble Command
mainframe 2-8
ATM RX TESt MASk Command
mainframe 2-8
ATM TX NETwork INTerface Command
mainframe 2-10
ATM TX PROfile Command
mainframe 2-10
ATM TX SCRamble Command
mainframe 2-11
ATM TX TESt PROfile Command
mainframe 2-11
Autobaud Setup for Terminal or Remote Control Operation
RS-232 remote control operation 1-3
Auxiliary Functions
remote control commands
DS1/DS0 analyzer option 1-15
mainframe 1-9

— B —

Bad command syntax.
error message A-1
Bad configuration parameter: xxxxx
error message A-1
Bad parameter: xxxxx
error message A-1
BEEp CRIteria Command
mainframe 2-11
BLUe SIGnal CRIteria Command
mainframe 2-12

— C —

CHAnnel FMT Command
DS1/DS0 analyzer option 2-59
Channel Format Select 2-59
Clear History Alarm LEDs
DS1/DS0 analyzer option 2-63
mainframe 2-21
Clear Print Buffer 2-12
CLEar PRInt BUFfer Command
mainframe 2-12
Clear Terminal Screen 2-12
CLS Command
mainframe 2-12
CODe Command
DS1/DS0 analyzer option 2-59
Command Formats and Entry Sequence
T-BERD 310
remote control commands 1-7
Command line too long (255 character limit).
error message A-1
CONTIguous Command
DS1/DS0 analyzer option 2-60
CONTRols Command
DS1/DS0 analyzer option 2-60
CONtrols Command
mainframe 2-12
Current configuration forces Recovered Timing mode
warning message A-3

— D —

DATaport Command
DS1/DS0 analyzer option 2-60

DISplay Command
mainframe 2-13

DISplay HOLd Command
DS1/DS0 analyzer option 2-60
mainframe 2-12

Display On-Line Help
DS1/DS0 analyzer option 2-62
mainframe 2-20

Display T-BERD 310 Software and Hardware Revision Levels 2-20

DS0 DROp CHAnnel Command
DS1/DS0 analyzer option 2-61

DS1 BITs CLK Command
mainframe 2-13

DS1 BITS Clock Termination 2-13

DS1 DROp CHAnnel Command
mainframe 2-13

DS1 DROp OUT Command
mainframe 2-14

DS1 INSert CHAnnel Command
mainframe 2-14

DS1 LINecode Command
mainframe 2-14

DS1 LP CODe Command
mainframe 2-14

DS1 SIGnaling BITs Command
mainframe 2-15

DS1 Signaling Bits Transfer Mode 2-15

DS1 SOUrce Command
DS1/DS0 analyzer option 2-61

DS1 Timing Slip Reference Source 2-74

DS1 VT MAP Command
mainframe 2-15

DS1/DS0 Analyzer Option
remote control commands
auxiliary functions 1-15
error messages 1-15
front-panel switches 1-14
remote control operation 1-14
remote control-only 1-15

DS1/DS3 ATM PLCP Error Insert Control 2-5

DS1/DS3 ATM PLCP Error Rate Control 2-5

DS1/DS3 ATM PLCP Error Type Control 2-6

DS1/VT Mapping Select 2-15

DS1's present in selected DS2; channel may differ.
warning message A-3

DS3 Jitter Threshold Select 2-23

DS3 SOUrce Command
mainframe 2-16

— E —

E1's present in selected DS2; channel may differ.
warning message A-3

ECHo Command
mainframe 2-16

Enter Remote Control Mode 2-45

Enter Terminal Mode 2-56

ERRor INSert BPV Command
DS1/DS0 analyzer option 2-61
mainframe 2-16

ERRor INSert FRAme Command
mainframe 2-16

ERRor INSert LOGic Command
DS1/DS0 analyzer option 2-61
mainframe 2-17

Error Messages A-1
DS1/DS0 analyzer option 1-15

ERRor THReshold Command
mainframe 2-17

ESF LOOp Command
DS1/DS0 analyzer option 2-62

Execute BPV Insertion
DS1/DS0 analyzer option 2-61
mainframe 2-16

Execute Frame Error Insertion 2-16

Execute Logic Error Insertion
DS1/DS0 analyzer option 2-61
mainframe 2-17

— F —

FEAc ALArms Command
mainframe 2-17

FEAc LOOp Command
mainframe 2-18

FEAC Message Alarm Control 2-17

FEAC Message Loopback Control 2-18

FIRST POWERUP Command
mainframe 2-19

FRActional-t1 TYPe Command
DS1/DS0 analyzer option 2-62

FRAme ERRor Command
mainframe 2-19
FRaMe LOSs THReshold Command
mainframe 2-19
Framing errors not allowed in DS1 Insert mode.
error message A-1
Framing errors not allowed in Thru & Auto modes.
error message A-1
Framing errors not allowed in Unframed mode
error message A-1
Front-Panel Switches
remote control commands
DS1/DS0 analyzer option 1-14
T-BERD 310 1-8
*see Individual Switches*
FT1 Channel Format Select 2-62
FT1 Contiguous Channel Select 2-60
FT1 Non-Contiguous Channel Select 2-65

— G —

General Messages A-3
Generate Controls Printout
DS1/DS0 analyzer option
@CONTRols 2-60
@PRInt CONtrols 2-67
mainframe
CONtrols 2-12
PRInt CONtrols 2-31
Generate Loop-Down Code 2-64
Generate Loop-Up Code 2-64
Generate Test Results Printout
DS1/DS0 analyzer option
@PRInt RESults 2-68
@RESUlts 2-73
mainframe
PRInt RESults 2-35
RESUlts 2-46

— H —

HELLO Command
mainframe 2-20
HELP Command
DS1/DS0 analyzer option 2-62
mainframe 2-20
HIStory RESet Command
DS1/DS0 analyzer option 2-63
mainframe 2-21
Hold All Printer Output 2-22
HOLd Command
mainframe 2-22

— I —

IEEE-488 Option
remote control operation 1-5
remote control commands 1-7
remote control mode 1-6
remote control setup procedure 1-5
Initiate Test Restart
DS1/DS0 analyzer option 2-72
mainframe 2-46
Input Sequence
T-BERD 310
remote control commands 1-13
Introduction
remote control commands 2-1
remote control operation 1-1

— J —

JITter FILter Command
mainframe 2-22
JITter SCAle Command
mainframe 2-23
JITter THReshold Command
mainframe 2-23

— L —

LASt ERRor Command
mainframe 2-24
LCD CONtrast Command
mainframe 2-24
LEDs Command
DS1/DS0 analyzer option 2-63
mainframe 2-24
LOCal Command
mainframe 2-25
LOG/bpv BURst Command
mainframe 2-25
LOG/bpv RT Command
mainframe 2-25
LOOp CODe Command
DS1/DS0 analyzer option 2-63

LOOp DOWn Command
DS1/DS0 analyzer option 2-64
LOOp UP Command
DS1/DS0 analyzer option 2-64

— M —

Manual Setup for Remote Control Operation
RS-232 remote control operation 1-2
MODe Command
DS1/DS0 analyzer option 2-64
mainframe 2-25
Multiple required options not installed.
error message A-1

— N —

No such command: xxxxx
error message A-1
No such help page: xxxxx
error message A-1
NON CONtiguous Command
DS1/DS0 analyzer option 2-65
Not allowed in IEEE-488 mode
error message A-2
Not enough command words specified.
error message A-2
Not enough letters specified: xxxxx
error message A-2
Not enough parameters specified.
error message A-2

— O —

Operation not allowed; not originating frame.
error message A-2
Operation not allowed; not transmitting C-bit.
error message A-2
Optical Power Measurement Wavelength Select 2-26
OPTical POWer WAVelength Command
mainframe 2-26
Optical Return Loss Measurement Reference Control 2-26
Optical Return Loss Measurement Type Select 2-26
OPTical RETurn LOSs REFerence Command
mainframe 2-26
OPTical RETurn LOSs TYPe Command
mainframe 2-26
OPTical SOUrce Command
mainframe 2-27
Optical Stable Source Select 2-27
Orderwire Channel Control 2-27
ORDerwire Command
mainframe 2-27
Output Sequence
T-BERD 310
remote control commands 1-13

— P —

Page name too long: xxxxx
error message A-2
Parameter out of range: xxxxx
error message A-2
Parameter(s) required.
error message A-2
PARity ERRor RT Command
mainframe 2-28
PATH TRAce Command
mainframe 2-28
Path Trace Message Insertion Control 2-28
PATTern Command
mainframe 2-29
PATtern Command
DS1/DS0 analyzer option 2-65
PATTern LOSs THReshold Command
mainframe 2-29
Pattern not changeable in current mode.
error message A-2
Pattern not supported by current mode.
error message A-2
PGM LPDn Command
DS1/DS0 analyzer option 2-66
mainframe 2-30
PGM LPUp Command
DS1/DS0 analyzer option 2-66
mainframe 2-30
Print All Received Overhead Bytes 2-35
Print All Transmitted SONET Overhead Bytes 2-55
PRInt BAUd RATe Command
mainframe 2-31
PRInt BYTE Command
mainframe 2-31
PRInt Command
DS1/DS0 analyzer option 2-69
mainframe 2-35

PRInt CONtrols Command
DS1/DS0 analyzer option 2-67
mainframe 2-31
PRInt CUStom Command
DS1/DS0 analyzer option 2-67
mainframe 2-31
PRInt EVEnt Command
mainframe 2-33
PRInt FORmat Command
mainframe 2-33
PRInt GRAph Command
mainframe 2-34
PRInt INTerval Command
mainframe 2-34
Print Last Error Message 2-24
PRInt MODe Command
mainframe 2-34
PRInt PARity Command
mainframe 2-34
Print Pulse Shape Graph 2-34
PRInt RESults Command
DS1/DS0 analyzer option 2-68
mainframe 2-35
Print RS-232 Interface Baud Rate 2-31
Print RS-232 Interface Parity 2-34
Print Selected Test Result
DS1/DS0 analyzer option 2-69
mainframe 2-35
Print Specified TOH Byte 2-31
Print State Of ATM LEDs 2-3
Print State of SONET Status and Alarm LEDs 2-52
Print State of Status and Alarm LEDs
DS1/DS0 analyzer option 2-63
mainframe 2-24
PRInt TERminator Command
mainframe 2-35
PRInt TOH BYTES Command
mainframe 2-35
PRInt WIDth Command
mainframe 2-35
PRM EMUlate Command
DS1/DS0 analyzer option 2-71
PRM RECeive Command
DS1/DS0 analyzer option 2-71
PRM Results Analysis Control 2-71
Programming Hints
IEEE-488 remote control operation 1-7
PROmpt Command
mainframe 2-40
Prompt string too long, truncated.
warning message A-3
Prompts in Terminal Mode
RS-232 remote control operation 1-4
PULse MASk Command
mainframe 2-41

— R —

RAW ATM LEDs Command
mainframe 2-42
Raw ATM Signal LED Status 2-42
Raw DS1/DS0 Signal LED Status 2-71
Raw DS3 Signal LED Status 2-41
RAW LEDs Command
DS1/DS0 analyzer option 2-71
mainframe 2-41
RAW SONet LEDs Command
mainframe 2-43
Raw SONET Signal LED Status 2-43
RECeive INPut Command
DS1/DS0 analyzer option 2-72
mainframe 2-44
Received ATM Cell Test Mask Control 2-8
Received ATM Cell Test Profile Bandwidth Select 2-6
Received ATM Cell Test Profile Control 2-7
Received ATM Cell Test Profile Preview Select 2-7
Received ATM Network Interface Select 2-6
Receiver 43-Bit Cell Payload Descrambler Control 2-8
Release All Printer Output 2-44
RELease Command
mainframe 2-44
REMote Command
mainframe 2-45
Remote Control cannot modify this setting.
error message A-2
Remote Control Commands 2-1
alphabetical list
DS1/DS0 analyzer option 2-59
mainframe 2-1
DS1/DS0 analyzer option 1-14
auxiliary functions 1-15
error messages 1-15
front-panel switches 1-14
remote control-only 1-15
IEEE-488 remote control operation 1-7

introduction 2-1
T-BERD 310 1-7
auxiliary functions 1-9
command formats and entry sequence 1-7
front-panel switches 1-8
input sequence 1-13
output sequence 1-13
remote control-only 1-12
Remote Control Messages A-1
description A-1
Remote Control Modes
IEEE-488 remote control operation 1-6
RS-232 remote control operation 1-4
Remote Control Operation
DS1/DS0 analyzer option 1-14
IEEE-488 remote control operation 1-5
introduction 1-1
RS-232 remote control operation 1-2
T-BERD 310 1-7
Remote Control Setup Procedure
IEEE-488 remote control operation 1-5
Remote Control-Only Commands
DS1/DS0 analyzer option 1-15
T-BERD 310 1-12
Required option not installed
error message A-2
RES1 or RES2 Command
DS1/DS0 analyzer option 2-72
mainframe 2-45
RESTART Command
DS1/DS0 analyzer option 2-72
mainframe 2-46
Restore T-BERD 310 to Factory Defaults/Retained Settings 2-19
Result N/A.
general message A-3
Result not supported by current ROM revision
error message A-2
Result unavailable.
general message A-3
RESUlts Command
DS1/DS0 analyzer option 2-73
mainframe 2-46
Return Control to the Front Panel 2-25
RS-232 Remote Control Operation
autobaud setup for terminal or remote control operation 1-3
manual setup for remote control operation 1-2
prompts in terminal mode 1-4
remote control modes 1-4
remote control operation 1-2
setup for remote control operation 1-2
terminating terminal or remote control operation 1-5

— S —

SCAn TRIgger Command
DS1/DS0 analyzer option 2-73
Seconds value ignored.
warning message A-3
Set 310-1 LCD Contrast 2-24
Set Alarm Message Printout Control 2-1
Set Beep Criteria 2-11
Set Blue Signal Detection Criteria 2-12
Set Calendar Date 2-46
Set Custom Results Printout
DS1/DS0 analyzer option 2-67
mainframe 2-31
Set Data Pattern
DS1/DS0 analyzer option 2-65
mainframe 2-29
Set DATAPORT Output 2-60
SET DATe Command
mainframe 2-46
Set Dense Wavelength Division Multiplexing Channel Select 2-58
Set Dense Wavelength Division Multiplexing Receive 2-58
Set Dense Wavelength Division Multiplexing Units 2-58
Set Display Hold
DS1/DS0 analyzer option 2-60
mainframe 2-12
Set Dropped DS0 Channel 2-61
Set Dropped DS1 Channel Source 2-14
Set Dropped DS1/E1 Channel 2-13
Set DS1 Input Source 2-61
Set DS1 Insert Channel 2-14
Set DS1 Line Code Type 2-59
Set DS1 Loop Code Type
DS1/DS0 analyzer option 2-63
mainframe 2-14
Set DS1 Receive Input Level 2-72
Set DS1 Transmit Timing Source 2-74
Set DS1 Transmitted Line Coding 2-14
Set DS3 Input Source 2-16
Set DS3 Transmit Output Level 2-57

WDM RX MODe Command
mainframe 2-58
WDM RX PEAk EXCursion Command
mainframe 2-59
WDM RX PEAk THReshold Command
mainframe 2-58
WDM RX UNIts Command
mainframe 2-58

20400 Observation Drive, Germantown, Maryland 20876-4023 USA
USA 1-800-638-2049 • +1-301-353-1550 • FAX +1-301-353-0234
Canada 1-888-689-2165 • +1-905-507-4117 • FAX +1-905-507-4126
www.ttc.com

16817A